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ANNUAL REPORT

—OF THE—

Biological
& Medical
Serials

MINNESOTA STATE

HORTICULTURAL SOCIETY

FOR THE YEAR 1886,

EMBRACING THE

TRANSACTIONS OF THE SOCIETY, FROM MARCH 31, 1885, TO MARCH
31, 1886, PROCEEDINGS OF ITS ANNUAL AND SEMI-ANNUAL
MEETINGS, ESSAYS, REPORTS, ETC.

VOL. XIV.



PREPARED BY THE SECRETARY, S. D. HILLMAN, MINNEAPOLIS, MINN.

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LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY, }
MINNEAPOLIS, March 31, 1886. }

To Hon. L. F. Hubbard, Governor of Minnesota:

SIR: I have the honor to submit herewith, in compliance with legal requisition, the accompanying report for 1886, with supplementary papers.

Respectfully yours,
S. D. HILLMAN,
Secretary Minnesota State Horticultural Society.

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OFFICERS AND MEMBERS FOR 1886.

PRESIDENT.

WYMAN ELLIOT.....Minneapolis

VICE-PRESIDENTS.

A. W. SIAS.....Rochester

E. H. S. DARTT.....Owatonna

M. CUTLER.....Sumter

F. G. GOULD.....Excelsior

G. W. FULLER.....Litchfield

SECRETARY.

S. D. HILLMAN.....Minneapolis

TREASURER.

J. T. GRIMES.....Minneapolis

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer *ex officio* and

J. S. HARRIS, Chairman.....La Crescent

J. M. UNDERWOOD.....Lake City

TRUMAN M. SMITH.....St. Paul

DITUS DAY.....Farmington

M. PEARCE.....Minneapolis

ENTOMOLOGIST.

Prof. O. W. OESTLUND.....Minneapolis

LIBRARIAN.

E. A. CUZNER.....College of Agriculture, Minneapolis

COMMITTEE ON SEEDLING FRUITS.

PETER M. GIDEON	Excelsior
J. S. HARRIS	La Crescent
J. M. UNDERWOOD.....	Lake City

COMMITTEE ON NOMENCLATURE.

A. W. SIAS.....	Rochester
A. W. LATHAM.....	Excelsior
E. D. JACKSON	Minneapolis

COMMITTEE ON FORESTRY.

J. T. GRIMES.....	Minneapolis
J. W. BOXELL.....	St. Paul
M. CUTLER.....	Sumter

COMMITTEE ON FRUIT BLOSSOMS.

PROF. E. D. PORTER.....	St. Anthony Park
GEORGE P. PEFFER.....	Pewaukee, Wis.
J. S. HARRIS.....	La Crescent

COMMITTEE ON RUSSIAN APPLES.

A. G. TUTTLE.....	Baraboo, Wis.
A. W. SIAS.....	Rochester
ANDREW PETERSON.....	Waconia

COMMITTEE ON VEGETABLE GARDENING.

WILLIAM LYONS.....	Minneapolis
GEORGE S. WOOLSEY.....	Minneapolis
W. H. BRIMHALL.....	St. Paul

COMMITTEE ON SMALL FRUITS.

TRUMAN M. SMITH.....	St. Paul
F. G. GOULD.....	Excelsior
M. KNOPP	Winona

GENERAL FRUIT COMMITTEE.

SIDNEY CORP.....	Hammond
D. K. MICHENOR.....	Etna
J. C. KRAMER.....	La Crescent
O. E. SAUNDERS.....	Granite Falls
O. F. NORWOOD.....	Balaton, Murray County
M. C. BUNNELL.....	Newport
N. J. STUBBS.....	Long Lake
WILLIAM McHENRY.....	St. Charles
O. M. LORD.....	Minnesota City
CLARENCE WEDGE.....	Albert Lea
GEORGE E. CASE.....	St. Peter
M. CUTLER.....	Sumter
G. W. FULLER.....	Litchfield
L. E. DAY.....	Farmington
CHARLES LUEDLOFF.....	Carver
W. E. BRIMHALL.....	St. Paul
WM. CANNON.....	Fort A. Lincoln, Dak.

SUBERINTENDENTS OF EXPERIMENTAL STATIONS.

PROF. EDWARD D. PORTER....	University Farm, St. Anthony Park
PETER M. GIDEON.....	Excelsior
M. PEARCE.....	Minneapolis
G. W. FULLER.....	Litchfield
A. W. SIAS.....	Rochester
R. M. PROBSTFIELD.....	Moorhead
F. J. SCHREIBER.....	Moorhead
ANDREW PETERSON.....	Waconia
CHARLES LUEDLOFF.....	Carver
UNDERWOOD & EMERY.....	Lake City
B. TAYLOR.....	Forestville
FRED VON BAUMBACH.....	Alexandria
E. H. S. DARTT.....	Owatonna
L. E. DAY.....	Farmington
J. S. HARRIS.....	La Crescent
O. M. LORD.....	Minnesota City

The members of the General Fruit Committee are expected to report separately on all matters of interest in Horticulture, but more especially to bring to the notice of the Society new and improved fruits.

ANNUAL MEMBERS, 1886.

ACKERMAN, J. H.....	Young America
ALLEN, JOSIAH.....	Red Wing
ANDREWS, JOHN P.....	Faribault
ARNOLD, JAMES.....	Hammond
AXTELL, A. E.....	Strawberry Point, Iowa
BARRETT, J. O.....	Brown's Valley
BASSETT, N. A.....	Glyndon
BASS, J. G.....	Minneapolis
BLAKELEY, CAPT. RUSSELL.....	St. Paul
BOST, A.....	Excelsior
BOST, T.....	Excelsior
BOXELL, J. W.....	St. Paul
BRASLAN, CHARLES P.....	Minneapolis
BRIMHALL, W. E.....	St. Paul
BRIMHALL, W. H.....	St. Paul
BROWN, C. F.....	St. Peter
BRYANT, DR. J. H.....	St. Paul
BUNNELL, M. C.....	Newport
BUSCH, FRED.....	Richfield
BUSSE, H. F.....	Minneapolis
BUSH, AVERY K.....	Dover
CALE, J. J.....	Minnetonka
CANNON, WILLIAM.....	Fort A. Lincoln, Dak.
CASS, DR. L. H.....	Blunt, Dak.
CHANDLER, E. M.....	Minnehaha
CLAUSSEN, EMIL J.....	Bismarck, Dak.
COE, R. JAY.....	Fort Atkinson, Wis.
CONKLING, F. AUGUSTUS.....	Brooklyn, N. Y.
CONVERSE, D. C.....	Fort Atkinson, Wis.
CORLETT, JOHN E.....	Farmersburg, Iowa
CORP, SIDNEY.....	Hammond
CRANDALL, CHARLES A.....	Sumter
CRANDALL, ETHAN.....	Sumter
CRITTENDEN, W. O.....	Dover
CUTLER, MILON.....	Sumter
CUZNER, E. A.....	Minneapolis
DANFORTH, WILLIAM.....	Red Wing
DARTT, E. H. S.....	Owatonna
DAY, DITUS.....	Farmington

DAY, L. E.....	Farmington
DAYTON, JOHN F.....	Waukon, Iowa
DEWEY, F. G.....	Esmond, Dak.
DOUGHTY, J. COLE.....	Lake City
DUNTON, H. J.....	Clearwater
EBERT, C. F.....	Tomah, Wis.
ELLSWORTH, H. R.....	Eldora, Iowa
EMERY, S. M.....	Lake City
FORD, J. A.....	Newport
FORSTER, WILLIAM.....	Chatfield
FOWLER, E. P. C.....	Lake City
FULLER, GEORGE W.....	Litchfield
GIBBS, GEORGE T.....	Minneapolis
GIBBS, JR., OLIVER.....	Ramsey, Dak.
GIDEON, JOSIAH.....	Excelsior
GILMORE, J. F.....	Richfield
GILPATRICK, ISAAC.....	Minneapolis
GOULD, F. G.....	Excelsior
GOULD, MRS. M. S.....	Excelsior
GRAY, J. S.....	Minneapolis
GREGG, O. C.....	Minneapolis
GRIESE, C. H.....	Cleveland, Mich.
GROAT, H. G.....	Anoka
HALL, PROF. C. W.....	Minneapolis
HARRINGTON, GEORGE W.....	Plainview
HARRIS, EUGENE E.....	La Crescent
HARRIS, FRANK I.....	La Crescent
HENDRICKSON, W. G.....	St. Paul
HILLMAN, S. D.....	Minneapolis
HINTGEN, MRS. MARY.....	La Crosse, Wis.
HIRSCHINGER, CHARLES.....	Baraboo, Wis.
HOAG, M. J.....	Rochester
HOLES, ANDREW.....	Moorhead
HOPKINS, W. J.....	Bloomington
HUNTINGTON, J. C.....	Excelsior
INGERSOLL, D. W.....	St. Paul
JACKSON, E. D.....	Minneapolis
JEHU, GEORGE.....	Hastings
JENKINS, J. W.....	Champlin
JORDAN, E. B.....	Rochester

KENNEY, SETH H.....	Morristown
KENNING, CHARLES.....	Bird Island
KLAPFLEISCH, C.....	Sumter
KNAPHEIDE, RUDOLPH.....	St. Paul
KNOPP, M.....	Winona
LABBITT, GEORGE.....	Lake City
LABBITT, H. L.....	Eldred, Cass Co., Dak.
LATHAM, A. W.....	Excelsior
LIBBEY, HOWARD.....	Red Wing
LOVELL, DR. E. W.....	Glyndon
LUEDLOFF, CHARLES.....	Carver
LYONS, WILLIAM.....	Minneapolis
MACKINTOSH, WILLIAM.....	Langdon
McARTHUR, A.....	Winnepeg, Manitoba
McHENRY, WILLIAM.....	St. Charles
MENDENHALL, R. J.....	Minneapolis
MILLS, L. D.....	Garden City
MORRELL, S.....	Milbank, Dak.
NOBLES, J.....	Sumter
NORBY, A.....	Madison, Dak.
NORTHRUP, J. E.....	Minneapolis
OSTERGREEN, EDWARD A.....	St. Paul
OWEN, S. M.....	Minneapolis
PALMER, CHARLES T.....	Minneapolis
PARKER, W. L.....	Farmington
PARTRIDGE, SAM.....	Moorehead
PETERSON, ANDREW.....	Waconia
POOLE, J. W.....	Farmington
PORTER, PROF. EDWARD D.....	St. Anthony Park
PUFFER, DR. F. L.....	Bird Island
REED, A. H.....	Glencoe
REGESTER, A. B.....	Granite Falls
ROBERTS, G. H.....	Minneapolis
ROGERS, GEORGE.....	Money Creek
ROWE, A.....	Minneapolis
RUNNING, S.....	Menominee, Wis.
SALZER, JOHN A.....	La Crosse, Wis.
SAUNDERS, O. E.....	Granite Falls
SAUNDERS, MRS. O. E.....	Granite Falls
SCHREIBER, F. J.....	Moorhead

SEELYE, C. W.....	Clearwater, Dak.
SHERREN, P. C.....	St. Paul
SHUMAN, GEORGE W.....	Minneapolis
SMITH, C. A.....	Minneapolis
SMITH, CALEB.....	Farmington
SMITH, C. L.....	Minneapolis
SMITH, FLORENCE.....	Cresbard, Faulk Co., Dak.
SOLEM, REV. O. A.....	Halstad
SOMERVILLE, WILLIAM.....	Viola
STUBBS, N. J.....	Excelsior
TANNER, WILLIAM.....	Cannon Falls
TAYLOR, HON. J. W.....	Winnepeg, Manitoba
UNDERWOOD, J. M.....	Lake City
VAN LOON, JOHN.....	La Crosse, Wis.
VARLEY, CHRIS.....	Big Lake
WARD, C. W.....	Sumter
WEDGE, CLARENCE.....	Albert Lea
WHIPPLE, KNIGHT H.....	Northome
WHITE, WILLIAM G.....	St. Paul
WOOD, H. D.....	Minneapolis
WOODRUFF, PHILO.....	Faribault
WOOLSEY, GEORGE S.....	Minneapolis
YOUNG, H. H.....	St. Paul

HONORARY MEMBERS FOR FIVE YEARS.

MRS. W. R. MURRAY, from 1881.....	Lake City
GEORGE J. KELLOGG, from 1882.....	Janesville, Wis.
G. P. PUTNAM, from 1882.....	Ash Ridge, Wis.
EDSON GAYLORD, from 1886.....	Nora Springs, Iowa

COMMITTEE ON FLORICULTURE.

MRS. C. O. VAN CLEVE.....	Minneapolis
MRS. F. G. GOULD.....	Excelsior
MRS. ANNA B. UNDERWOOD.....	Lake City

COMMITTEE ON LEGISLATION.

WYMAN ELLIOT.....	Minneapolis
TRUMAN M. SMITH.....	St. Paul
PROF. E. D. PORTER.....	St. Anthony Park

HONORARY LIFE MEMBERS.

HON. MARSHALL P. WILDER.....	Boston, Mass.
DR. JOHN P. WARDER (deceased).....	North Bend, Ohio
DR. P. A. JEWELL (deceased).....	Lake City
HON. L. B. HODGES (deceased).....	St. Paul
D. W. HUMPHREY (deceased).....	Faribault
HON. N. J. COLMAN.....	St. Louis, Mo.
GEORGE P. PEFFER.....	Pewaukee, Wis.
J. C. PLUMB.....	Milton, Wis.
J. M. SMITH.....	Green Bay, Wis.
E. WILCOX.....	La Crosse, Wis.
PROF. J. L. BUDD.....	Ames, Iowa
A. G. TUTTLE.....	Baraboo, Wis.
F. K. PHOENIX.....	Delavan, Wis.
J. W. MANNING.....	Reading, Mass.
MRS. J. W. MANNING.....	Reading, Mass.
MRS. WM. PAIST.....	Hersey
CHARLES Y. LACY.....	Fort Benton, M. T.
COL. J. H. STEVENS.....	Minneapolis
J. S. HARRIS.....	La Crescent
R. J. MENDENHALL.....	Minneapolis
TRUMAN M. SMITH.....	St. Paul
L. M. FORD.....	St. Paul
WYMAN ELLIOT.....	Minneapolis
CHARLES HOAG.....	Minneapolis
J. T. GRIMES.....	Minneapolis
MRS. C. O. VAN CLEVE.....	Minneapolis
A. W. SIAS.....	Rochester
PETER M. GIDEON.....	Excelsior
MRS. WEALTHY GIDEON.....	Excelsior
M. PEARCE.....	Minneapolis
COL. D. A. ROBERTSON.....	St. Paul
R. L. COTTERELL.....	Dover
CHAS. LEUDLOFF.....	Carver
MRS. JAMES BOWEN.....	Minneapolis
MRS. IDA E. TILSON.....	West Salem, Wis.
MRS. H. B. SARGEANT.....	Lake City
MISS SARAH MANNING.....	Lake City

OFFICERS

OF THE

MINNESOTA STATE AGRICULTURAL SOCIETY

FOR THE YEAR 1886.

PRESIDENT.

HORACE W. PRATT.....Faribault

VICE-PRESIDENTS.

WM. R. MERRIAM.....St. Paul

FRED C. PILLSBURY.....Minneapolis

SECRETARY.

R. C. JUDSON.....Farmington

TREASURER.

F. J. WILCOX.....Northfield

BOARD OF MANAGERS.

JAS. McHENCH.....Fairmont

J. S. HARRIS.....La Crescent

A. N. JOHNSON.....Benson

CLARK CHAMBERS.....Owatonna

JOHN COOPER.....St. Cloud

JOHN F. NORRISH.....Hastings

The next Annual Fair will be held on the new State Fair Grounds between Minneapolis and St. Paul, Aug. 30 to Sept. 4, 1886. No effort will be spared to make it the best agricultural and horticultural exposition of the year.

Liberal premiums offered in every department.

THE LAW RELATING TO THE PRINTING AND DIS-
TRIBUTION OF THE HORTICULTURAL
REPORTS.

CHAPTER 8, GENERAL LAWS OF 1883.

AN ACT TO AMEND CHAPTER SEVENTY-TWO (72) OF THE GENERAL LAWS OF ONE THOUSAND EIGHT HUNDRED AND EIGHTY-ONE (1881) RELATING TO THE STATE HORTICULTURAL SOCIETY.

Be it enacted by the Legislature of the State of Minnesota.

SECTION 1. Sections one (1) and two (2) of chapter seventy-two of the General Laws of one thousand eight hundred and eighty-one (1881) relating to the State Horticultural Society shall be amended so as to read as follows:

SEC. 1. There shall be annually printed and bound thirty-five hundred (3500) copies of the annual report of the State Horticultural Society, provided the number of printed pages of the same shall not exceed five hundred (500); which report shall be transmitted to the governor and shall be distributed by the State Horticultural Society, as follows:

One (1) copy to each of the State officers, members of the legislature, judges and clerks of the supreme and district courts, county auditors and members of the board of regents and faculty of the State University; fifty (50) copies to the State Historical Society; one hundred (100) copies to the State Board of Immigration; one hundred (100) copies to the State Agricultural Society in exchange for a like number of its annual reports; and a sufficient number of copies to each county horticultural society to supply one copy to each of its members; provided, such county society shall be in active existence, and shall have filed with the Secretary of the State Horticultural Society a list of its officers and committees, and an abstract of its proceedings for the year preceding; and the remaining copies shall be distributed by the State Horticultural Society, in such manner as it shall deem best, after retaining a sufficient number for its library and to supply future members and exchanges.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved February 28, 1883.

CONSTITUTION

OF THE

Minnesota Horticultural Society.

ARTICLE I.

NAME.

This society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.

OBJECT OF THE SOCIETY.

The object of this society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other productions in horticulture as are adapted to the soil and climate of Minnesota.

ARTICLE III.

MEMBERSHIP.

Any person may become a member by paying to the Secretary or treasurer an annual fee of one dollar, or a life member by the payment of ten dollars. Honorary members, for a time stated or for life, may be elected at any annual meeting by a two-thirds vote of the society, and shall be entitled to all the rights and privileges of membership.

ARTICLE IV.

OFFICERS.

Its officers shall consist of a president and one vice president from each congressional district, a secretary, treasurer, and an executive committee of five, and a librarian.

ARTICLE V.

DUTIES OF PRESIDENT AND VICE PRESIDENTS.

The President shall preside at and conduct all meetings of the society, and deliver an annual address, and in his absence the Vice Presidents, in their order, shall perform the same duties. They shall also have a general supervision of the horticultural interests in their respective districts, and make a written report to the society at its annual winter meeting; in consideration of which the society shall pay their traveling expenses to the same.

ARTICLE VI.

THE SECRETARY.

The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all moneys received from members or otherwise to the treasurer on his receipt; receive and answer all communications addressed to the secretary, establish and maintain correspondence with all local, county, district and state horticultural societies, and secure by exchange their transactions, as far as possible; to aid the president as an executive officer in the dispatch of business relating to meetings of the society, notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which, with its approval, shall become part of its transactions for the current year.

ARTICLE VII.

THE TREASURER.

The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the president, countersigned by the secretary. He shall make up a report of all the receipts and disbursements of the society, and present the same at the annual winter

meeting, or at any other time when called upon to do so by the executive committee. He shall give bonds in such sum as the society may direct, to be approved by the president and secretary, and the bond when so approved shall be filed with the state auditor.

ARTICLE VIII.

ELECTION OF OFFICERS.

The officers shall be elected separately and annually by ballot, and hold their office until their successors are elected.

ARTICLE IX.

MEETINGS OF THE SOCIETY.

The society shall hold annual sessions on the third Tuesday of January, and other meetings at such time and place as the society may direct.

ARTICLE X.

THE LIBRARIAN.

The Librarian shall have charge of the library and report its condition at each annual meeting.

ARTICLE XI.

AMENDMENTS.

By-laws and alterations of the constitution, for the purpose of meeting the further wants of the society, may be enacted by a vote of two-thirds of the members present at any regular annual meeting, and on one day's notice of the same being given.

BY-LAWS.

1. The president, at each annual meeting of the society, shall appoint a general fruit committee, consisting of two members from each congressional district in the State, and it shall be the duty of each member to make a written report annually upon the fruit crop, and a limited list of fruits best adapted for general cultivation in their respective districts.

2. The president, secretary and treasurer shall be members *ex officio* of the executive committee, who shall have charge of all matters pertaining to the interests of the society.

3. The executive committee may call a meeting of the society at any time they may deem advisable, giving at least thirty days' notice through the public press.

4. The executive committee shall appoint a committee on seedlings, on nomenclature, on forestry, on fruit blossoms, on Russian apples, on gardening, on small fruits, and on floriculture.

5. The five members of the executive committee, not including the president, secretary or treasurer, shall be a committee on finance, and it shall be their duty to audit all bills before they shall be ordered paid by the president and secretary.

6. The executive committee shall see that a program is issued for each meeting of the society, at least one month before the winter meeting and ten days before the summer meeting.

7. Every member shall be entitled to one copy of the transactions as often as published, on which postage shall be paid; but in the distribution of all other copies the party receiving the same shall pay the postage; where several copies are sent to auxiliary societies it shall be discretionary with the secretary to pay the freight.

8. *Quorum*. A quorum shall consist of nine members of the society, or a majority of the executive committee.

MINNESOTA STATE HORTICULTURAL SOCIETY.

TRANSACTIONS 1885-6.

THE SUMMER MEETING, 1885.

The nineteenth semi-annual summer meeting of the Minnesota State Horticultural Society, in accordance with the action taken by the society at its annual session in January, was held in Minneapolis, at Market Hall, Wednesday and Thursday, June 24 and 25, 1885.

The meeting was held in connection with the Hennepin County Horticultural Society, the attendance throughout the sessions was quite large and the proceedings of more than usual interest. Following are the program, premium list and rules issued in the circulars sent out announcing the meeting:

PROGRAM.

FIRST DAY, WEDNESDAY, JUNE 24.

9:00 to 12:00 M. Making entries, setting up and arranging exhibits.

2:00 P. M. Opening Exercises; appointment of committees.

2:30 P. M. Address of welcome by Prof. E. D. Porter.

Response by President T. M. Smith.

3:00 P. M. Paper on Strawberries by M. Pearce.

Discussion.

5:00 P. M. Paper on Insects by Prof. Wm. Trelease, of Madison, Wis.

SECOND DAY, THURSDAY, JUNE 26.

9:00 A. M. Communications and unfinished business.

9:30 A. M. Paper—Practical suggestions on the Growing of Small Fruits, by C. H. Hamilton, of Ripon, Wis.

10:00 A. M. Paper, by J. L. Budd, Professor of Horticulture, Ames, Iowa.

10:30 A. M. Verbal or written reports on the Fruit Outlook for the Year.

Discussion and Question Box.

11:30 A. M. Report of committees on Awards.

12:00 M. Picnic.

AFTERNOON.

1:30 P. M. Visit to Parks and Horticultural Gardens in and adjacent to Minneapolis.

PREMIUM LIST.

WYMAN ELLIOT, Superintendent of Exhibits.

STRAWBERRIES.

	1st Prem.	2d Prem.
Best general collection of not less than five named varieties, one pint each.....	\$5 00	\$3 00
Best four varieties, one quart each.....	3 00	2 00
Best Minnesota Seedling, not before exhibited..	5 00	3 00
Best three plants in pots.....	2 00	1 00
Best three quarts Wilson's Albany.....	2 00	1 00
Best three quarts Downer's Prolific.....	2 00	1 00
Best three quarts Charles Downing.....	2 00	1 00
Best three quarts Crescent Seedling....	2 00	1 00
Best three quarts James Vick.....	2 00	1 00
Best three quarts Manchester.....	2 00	1 00
Best three quarts Glendale.....	2 00	1 00

STRAWBERRIES—Concluded.

	1st Prem.	2d Prem.
Best three quarts Longfellow.....	\$2 00	\$1 00
Best three quarts Cumberland Triumph.....	2 00	1 00
Best three quarts Minnetonka Chief.....	2 00	1 00
Largest fruit of any variety.....	2 00	1 00

The same premiums may be awarded upon other varieties of equal merit.

Best and neatest 16 or more quart crate.

Best quart boxes.

Best quart baskets.

CURRANTS AND CHERRIES.

Best quart currants, variety named, green or ripe.....	\$2 00	\$1 00
Best quart of cherries, ripe.....	2 00	1 00

RASPBERRIES.

Best collection, not less than three varieties, one pint each.....	\$3 00	\$2 00
Best pint of each variety in separate exhibits...	2 00	1 00

VEGETABLES.

Best collection, not less than six varieties, grown by exhibitor.....	\$5 00	\$3 00
Best 3 bunches of Asparagus	1 00	50
Best 6 Beets	1 00	50
Best 6 Carrots	1 00	50
Best 6 Onions.....	1 00	50
Best 6 Radishes.....	1 00	50
Best 6 Turnips	1.00	50
Best 6 Stalks Pie Plant.....	1 00	50
Best 6 Heads Lettuce	1 00	50
Best 3 Heads of Cabbage	1 00	50
Best 3 Heads of Cauliflower	1 00	50
Best ½ peck Green Peas	1 00	50
Best ½ peck of String Beans.....	1 00	50

VEGETABLES—Concluded.

	1st Prem.	2d Prem.
Best $\frac{1}{2}$ peck of New Potatoes	\$1 00	\$ 50
Best 6 Cucumbers	1 00	50
Best 6 Summer Squash.....	1 00	50
Best $\frac{1}{2}$ bushel of old Potatoes, with statement of method of growing and keeping.....	2 00	1 00

FLOWERS.

Best table design of Cut Flowers.....	\$5 00	\$3 00
Best basket of Cut Flowers.....	2 00	1 00
Best bouquet of Roses.....	2 00	1 00
Best Hand Bouquet.....	2 00	1 00
Best collection of Wild Flowers.....	2 00	1 00
Best collection of Perpetual Roses	2 00	1 00
Best collection of Geraniums	2 00	1 00
Best collection of Pansies	2 00	1 00

RULES.

1. As the object of this meeting is to cultivate a better acquaintance with our horticulturists and encourage the home production of small fruits and early vegetables of the best quality, all exhibitors are requested to place with their exhibits a concise written statement of their methods of treatment, cultivation and soil, exposure, protection and best method of marketing their produce.

2. All fruits should be fully ripe or in best state of maturity for home use or market, and in such a condition that their merits may be fairly reported upon.

3. All vegetables should be shown in the most attractive style for placing on the market.

4. The awarding committee shall close their labor before 10 o'clock A. M., and report to the society at 11 A. M. of the second day of the meeting. Their report shall contain the names and post office address of each contributor to the exhibition, and in each case where prizes are awarded, note the points upon which they predicate their

decisions, and they shall have power to recommend special premiums for seedlings, and articles of especial merit, not provided for in the schedule of premiums.

They shall not award premiums to contributions unworthy of exhibition, even if there is no competition, or where the conditions governing the exhibition have not been complied with.

5. Competition shall be open to all, but the annual membership fee of \$1.00 will be deducted from premiums awarded to persons who are not members of the State Horticultural Society.

6. All entries must be made in the name of the producer, or, in the case of new seedlings, in the name of the present owner of the stock, but the name of the originator, when known, should accompany the entry.



PROCEEDINGS AT THE SUMMER MEETING.

FIRST DAY.

WEDNESDAY, JUNE 24, 1885.

The summer meeting of the State Horticultural Society was held pursuant to notice, and the morning of the first day was devoted to the arrangement of exhibits and making entries. The number of entries made and the quality of fruit exhibited was most gratifying, especially of strawberries, the specimens shown being remarkably large and fine.

EXHIBITORS AND EXHIBITS.

Following is a list of exhibitors and their exhibits:

J. S. Harris, La Crescent, two quarts Sharpless strawberries, two quarts seedlings, and six bunches pie plant.

A. W. Sias, Rochester, one quart Sharpless strawberries, three quarts Cumberland Triumph and two quarts Crescent seedling.

J. C. Kramer, La Crescent seedling strawberries, and Kramer's seedlings, Glendale, Wilson, Crescent and Capt. Jack strawberries, five bunches asparagus and boquet of wild flowers.

G. H. Roberts, Minneapolis, three quarts each Countess and Sharpless strawberries; one-half peck peas, "first and best;" boquet roses.

Truman M. Smith, St. Paul, three bunches asparagus, quart Bright Idea strawberries.

F. X. Crepeau, Minneapolis, five bunches pie plant and six dozen asparagus.

H. N. Dean, Minneapolis, pie plant.

H. N. Dyar, Long Lake, two quarts Sharpless strawberries.

Fred Busch, Richfield, three heads cabbage, three of cauliflower and six cucumbers.

N. H. Reves, Minneapolis, six heads lettuce and six onions.

Mrs. M. A. Pearce, Minneapolis, boquet roses.

M. Pearce, Minneapolis, two quarts Sharpless strawberries.

C. A. Smith, Minneapolis, collection geraniums.

Mrs. M. J. Hillman, Minneapolis, potted plants.

E. A. Ostergreen, St. Paul, three heads cauliflower.

J. F. Gilmore, Minneapolis, Stewart seedling currants, Hixon and Smith's Improved Gooseberries, and James Vick strawberries.

F. H. Busse, Minneapolis, three quarts Crescent, one quart Wilson, one-half dozen plants with fruit (Crescent), three stems seedling strawberry, eight boxes of Crescent and Wilson strawberries.

Prof. L. Asire, Minneapolis, Crescent and Glendale strawberries, three quarts each.

G. S. Woulsey, Minneapolis, strawberries of Wilson, Glendale, Crescent, Minnetonka Chief, Eureka, Manchester, Longfellow, Warner, Countess and Miners' Prolific.

J. T. Grimes, Minneapolis, three quarts Old Iron Clad, three quarts Piper's seedling, four bunches asparagus, six stalks pieplant and six varieties peonies.

Oliver Gibbs, Jr. Lake City, Glendale strawberries.

John Van Loon, La Crosse, Wis., three quarts Bidwell and three quarts Boyden No. 30 strawberries.

Mrs. M. E. Hintgen, La Crosse, Wis., three quarts Sharpless two quarts Glendale and two quarts seedling strawberries.

Wm. Lyons, Minneapolis, Minnesota seedling strawberries, Manchester and Minnetonka Chief; collection of vegetables.

J. S. Gray, Minneapolis, doz. heads lettuce; carrots, onions, cauliflower, pieplant, turnips, raddish, Dill.

AFTERNOON SESSION.

The meeting was called to order by President Truman M. Smith of St. Paul, at 3 o'clock P. M., and the following committees were appointed:

On Fruit.—Ditus Day, Farmington; F. A. Conkling, Brooklyn, N. Y., and Isaac Gilpatrick, Minneapolis.

On Flowers.—A. W. Sias, Rochester; M. Pearce, Minneapolis, and Col. J. H. Stevens, Minneapolis.

On Vegetables.—Wyman Elliot, Minneapolis; H. H. Young, St. Paul, and G. W. Fuller, Litchfield.

On Resolutions.—J. S. Harris, La Crescent; G. W. Fuller, Litchfield, and J. T. Grimes, Minneapolis.

ADDRESS OF WELCOME AND RESPONSE.

Col. John H. Stevens, in the absence of Prof. Porter of the State University Farm, delivered the Address of Welcome.

Col. Stevens said: Mr. President and Gentlemen: It has been my pleasure to extend a welcome to the members of the State Horticultural Society to Minneapolis, nearly a score of times in the past and I regret that Prof. Porter is not present to attend to that part of the program and to discharge the duty assigned to him. I can only say, however, on behalf of the citizens of Minneapolis, that we most cordially welcome you here. You are engaged in a work that we all should and all do take a deep interest in; there is hardly a more inviting field for labor and usefulness than that of horticulture, and I hope and trust that in your deliberations you may accomplish that which will be for the good of the State, and that your efforts will be crowned with success. There is no doubt that the grand cause of horticulture in this State has been forwarded at least ten or fifteen years by your society beyond what it would have been without that assistance. Again bidding you welcome here we trust that your meeting will be attended with that interest which will give encouragement and success to your noble work in which you are engaged.

The response to the address of welcome was delivered by President Smith.

President Smith. I see they have me down for a speech, but I am unprepared. However I will say a few words. The people of Minnesota who, like Col. Stevens and myself, can look back to a period thirty or thirty-five years ago and view the progress made during that time within what is now the city of Minneapolis, may be gratified at the progress made in a material way, and when they think of the condition of things then and contrast them with those of to-day, they will see there has been plenty of work for the State Horticultural Society as well as other societies and institutions. When I first came on this side of the Falls of St. Anthony to the site of what is now Minneapolis, there was but one little log house standing away down here, [point-

ing in the direction of the Falls] and an old mill. Contrast that with what we see to-day, and behold the difference. Look at what has been done within that short space of time. At that time we were told that we could not even grow corn in Minnesota and we never would be able to grow fruit, and nothing of that sort could be expected in this climate. But look at the mills and manufactories of Minneapolis and St. Paul to-day, and then see the kinds and vast quantities of fruits constantly brought to market. It has been estimated that as many as sixteen thousand quarts of strawberries are daily brought to market at St. Paul and by 9 o'clock they are all cleaned off. This shows that population is rapidly increasing and it reminds us that we have a work to do. We must educate the people to grow those fruits and flowers that can be grown most successfully and prepare the way for future generations. It is a work of responsibility and there are few who realize the responsibility more than I do and their incapacity for the task that lies before us. I tell you that we must grow our own fruits and have a surplus to ship away, and not be dependent upon countries below to supply our wants in this regard, thus draining us of all our spare funds to purchase a few of the luxuries of life. And if we could interest the people and they would turn out en masse to our meetings and see our exhibits and learn how to plant and cultivate these fruits, flowers and vegetables, what a benefit it would be to the State and to the city as well. Minneapolis I must say has always given us an encouraging hand; they have always been ready to welcome us. There is no city or town in the state that has been more ready to welcome horticulture and horticulturists than Minneapolis. Thanking the citizens of Minneapolis on behalf of the Society for their hospitality I will not occupy your time further.

COMMUNICATIONS.

The following communications were then read by the secretary :

FROM A. L. HATCH, ITHICA, WIS.

Mr. A. L. Hatch of Ithica, Wis., under date of May 9, 1885, writes:

"S. D. Hillman, Secretary, etc.,

DEAR SIR: Your invitation of April 30th has awaited an answer because I have been too busy to reply sooner. I regret exceedingly my inability to comply with your request. Besides my ordinary farm and nursery cares, now so much behind on account of such extraordinary

weather, I am trying to build a dwelling and I have no leisure whatever. There is a bond of sympathy between us, augmented, no doubt by the disasters of the past very cold winter—such sympathy as comes from the commiseration of common misfortunes, if not from common success. No doubt after the many funeral services we shall be compelled to hold over dead pets and blighted hopes, we should get encouragement from a meeting of your Society, whose circumstances as horticulturists so nearly resemble our own. As it is we can only offer you our good will and hope ere long to be able to render you material assistance in your horticultural work, so courageously undertaken.

Respectfully,

A. L. HATCH."

FRUIT REPORT, BY GEO. J. KELLOGG, JANESVILLE, WIS.

The following fruit report was then read:

The effects of the past winter are very disastrous and singularly marked, especially among small fruits. Among apple trees there is the finishing up of our borne trees, and of those partially killed the two previous winters. In the orchard Red Astrichan, Golden Russet, Talman Sweet and many others of this hardy list have lost a limb and occasionally a tree. Willow Twig seems least effected in the orchard of any winter apple in the nursery, it frequently injures badly—Duchess and Tetofsky are most hardy of all; though most of the new Russians seem hardy enough but are predisposed to blights. The winter of 1882-3 was more severe on apples than any winter for the last ten years. I had Wealthy kill to the ground in the nursery and everything but Duchess, Tetofsky and New Russian were more or less injured. Among the Raspberries *new* plantations have suffered least. Turner and Crimson Beauty seem most hardy among the Red. Old Plantations of Cuthbert and Brandywine, Hansell and Sheffers Colossal are killed to snow line and in some cases to the ground, while new plantations of the same kind are fruiting to the tips. Among the blacks about the same appearance with Gregg, Tyler, Sonhegan, Onandaga, Ohio, M. Cluster, &c. The old plantations are hardly worth standing, some even killed to the ground, while most of the new plantings are fruiting to the tips.

Strawberries, except when not covered and in low places, have wintered well and are loaded with fruit—of the comparative value of kinds it is too early to form a correct opinion.

Crescent beats all for production while Countess is a profitable fertilizer.

Vick and Piper give abundant promise, but if their promises are not redeemed better than last year they will go under with many others.

Blackberries are a failure unless protected; the Dewberry is easiest covered and the earliest to ripen, gives a good crop when well cultivated. The Snyder and Stone's Hardy are showing an occasional branch in bloom when unprotected. Taylor's Prolific, Ancient Briton, Western Triumph, Early Harvest, Stayman's Early and many others have shared a like fate. Acres have been mowed and burned—there is no safety except by covering, and even then there is danger of uncovering just before a prize and get the tender buds nipped.

The grapes are promising full, when well cared for—there is no use trying to raise any fruit without care.

Truly the horticulturists' path is strewn with thorns beside those on roses.

GEO. J. KELLOGG.

JANESVILLE, WISCONSIN, June 15, 1885.

A letter was read from C. Hamilton, of Ripon, Wis., regretting his inability to be present at the meeting and enclosing a paper on small fruits, furnished by request, and closing with good wishes for the success of the Society, etc. The paper referred to will appear further along in this report.

FRUIT REPORT BY ANDREW PETERSON, WACONIA.

The following report on Russian varieties of fruit, from Mr. Peterson of Waconia, was then read:

WACONIA, CARVER CO., MINN., JUNE 19, 1885.

S. D. Hillman, Secretary, etc.

DEAR SIR: I am very thankful for the program and the letter you send me, but am sorry to say that I cannot be at the meeting, as I shall not be at home at that time. I send you a short report on the condition of apple trees after the past severe winter at my place. Most of the Wealthy are entirely killed and the rest are so badly damaged they will probably die another year. The Duchess is damaged a good deal. Some of the Russian varieties, perhaps eight or ten, are injured more or less; some of them I suppose will die. Little Seedling and Transparent are not hardy trees. The Christmas apple seems

hardy. The varieties that withstood the past hard winter are the following: Hibernial, Ostrekoff's Glass, Charlemoff, Lieby, Red Checked. All of these look as nice as ever before, and there is a great deal of fruit on the trees. I have been in Minnesota over thirty years but I never saw so much damage done to fruit trees as we have had from the past winter. Early Richmond and Mountain Hess cherry trees, ten years old, are entirely killed.

Very Respectfully,

ANDREW PETERSON.

FROM PROF. J. L. BUDD, AMES, IOWA.

The following letter from Prof. Budd, of the Iowa Agricultural College, was then read:

Secy. Minn. State Horticultural Society.

MY DEAR SIR: I am sorry that I cannot meet with you as I wish to go to Washington with a view to getting aid from the Department of Agriculture in our adapting fruits, etc., to our Valley.

The past winter has wrought fearful havoc with our old list of fruits, but the Wealthy, Duchess and all the true Russ apples came out clean and white as did a few of the Russian pears, all of the plums from the East plain and all of the cherries and shrubs from Central Russia. For once theory and practice walk hand in hand. What I wrote from Europe two years ago has been verified by this last winter to a dot. In other words the products of like soils and climates live with us.

J. L. B.

FROM A. G. TUTTLE, BARABOO, WIS.

The following communication was read from A. G. Tuttle, of Baraboo, Wis.:

BARABOO, WIS., June 22, 1885.

S. D. Hillman, Esq.

DEAR SIR: I received your letter with sheets of your report. I find that what I said at your meeting is somewhat mixed up; I have made some corrections and return them.

Prof. Budd claims not to have been correctly reported in what I said about my list of Russian apples. You will find in one of your reports a letter from him to your secretary in which he says that the Russians that I have are not from interior Russia and not adapted

to Minnesota. I wrote him in regard to it, and the only excuse he made was that he did not expect the letter to be published. I have no desire for any controversy with Prof. Budd, for I believe we agree on this, that there is absolute certainty that the Russian fruits will prove perfectly adapted to the great prairie regions of the northwest. This is what we aim to prove and what the people would be glad to know. If I ever had any doubts of their perfect adaptation the results of the *extreme, long continued cold* of last winter and its effect upon our orchards, destroying nearly everything of American origin while at the same time all the new Russian apples and pears are in splendid condition—is proof positive to me that they are just what we need and that they have just come in time.

I am confident that there are none among them but what are as hardy as the Wealthy, even those the most tender, and very many of them are much hardier than the Duchess; among them is the Hibernial, its large, dark, glossy foliage and enormous crop of fruit tells its story of extreme hardship, after passing through such a trying winter. Longfield, after maturing a crop of fruit the largest ever borne by any ten on my place comes out this spring perfectly healthy though showing but little fruit. The Antonooka never looked better; we had a single apple of that variety last season, which I have yet in good condition. There never has been such a universal wreck. Trees that have stood in my orchard for over thirty years coming out of all the severe winters, during that time uninjured are now dead by the hundred. I have one orchard of 300 trees each alternate row Duchess and Utters. There are not five trees of the Utters that will ever recover, and some of the Duchess are badly injured but only a few; which seems very strange, as in my Russian orchard of over eighty varieties not a tree is injured. The bright and healthy foliage of this orchard in contrast with my orchard of common varieties will satisfy any one of the value to us of Russian apples.

I should be glad to give you more information about our Russian fruits but my time is so fully occupied I must close this hastily written letter.

Yours &c.

A. G. TUTTLE.

The following report of the secretary of the Missouri Horticultural Society was read:

“The fruit prospect June 1st, is somewhat better than was expected

after the cold spring. The prospect for a full crop is as follows, 100 representing a full crop:

Apples, 66 per cent; Plums, 71 per cent; Pears, 65 per cent; Cherries, 64 per cent; Grapes, 51 per cent; Raspberries, 84 per cent; Strawberries, 93 per cent; Blackberries, 41 per cent.

Peaches are an entire failure, except south of Springfield; after going below 37 degrees, we find there is quite a full crop, so that in the southern part of the State, especially the last tier of counties, we find an average of 78 per cent given. In many parts of the State the report shows that the peach trees are injured very badly, and that many thousands of trees are dead or dying. As matters now stand we must look to the southern part of our State for peaches in the future. But we must plant more in all parts of the State—make another trial.

Apples. The best prospect for apples seems to be in the southern third of the State. Much complaint is being made of their falling off, and the report in August will change this report considerably.

Strawberries will be abundant and low in price.

Raspberries will also be quite abundant, more so than last year.

Blackberries are poor and will be scarce. With the rust and cold winter injuring the plants, we find that the fruit will be in extra demand this season.

Grapes also will be in good demand, and the finer varieties will be very hard to get, being very much injured by the winter.

The varieties having the best prospects are:

Apples—Ben Davis, Willow Twig, Maiden Blush, Huntsman, Red Astrichan, Early Harvest, Jonathan, Missouri Pippin.

Pears—Bartlett, Seckel, Buffum B. Anjon.

Plum—Wild Goose, Weaver, Miner.

Cherry—Early Richmond, Ostheim, English Morello.

Trees injured by winter are nearly all varieties of peach, all tender cherries and a few varieties of apples. Some have been injured by bursting of the bark, others by the branches being frozen. Many varieties of grapes were badly injured, notably the Gæthe, Wilder, Lady Washington, Herbemont, Creveling, Catawba, Hartford, and even Nortons and Isabella. Raspberries were injured in some portions of the State; the Cuthbert not standing the cold well; even Turner and Thwack in low places are injured. In very few locations do the newer sorts seem to be hardy. But one variety of blackberries seems to be hardy, and that is the Snyder. We must look for some new blackberry—some native which will be both hardy and productive. I be-

lieve this can be found, and will be, if we look for it; then we can raise some as fine blackberries as were seen years ago.

The whole of this report I believe will be lowered by the August report, and I fear we will yet have to report less than half a crop of apples, perhaps even one-third.

The reports from other States have not yet been received, but from private sources I believe that few States will have more than half a crop of apples.

L. A. GOODMAN, Secretary."

President Smith announced the next thing in order would be a paper from Mr. Pearce, of Minneapolis.

STRAWBERRY CULTURE.

BY M. PEARCE.

Mr. President, I am at a loss in determining what to say to catch the attention of horticulturists and arouse them to action on this, a subject of the utmost importance to farmers and all having houses and homes, and especially those located in the vast prairie districts. Of all fruits I know of nothing earlier or more reliable than the strawberry, and no crop gives better profit to the grower. The cost of plowing one acre of corn land is \$2; harrowing, seventy-five cents; 7,000 strawberry plants, \$28; planting them with a line three and one-half feet one way and fifteen inches the other, \$5; cultivating and hoeing during the summer, \$12; mulching very lightly in the winter with marsh hay or straw, \$6—making a total cost per acre of \$53.75. This covers all material expenses up to the picking season. An average crop per acre of a good variety of strawberry should not be less than 250 bushels, and with the best of soil and cultivation and abundance of water, the number of bushels per acre can be increased to 500. On a basis of 250 bushels at the low rate of ten cents per quart, the value will be \$800 per acre; the expense of picking, boxes and crates, \$240, having a net profit of \$560 per acre.

The greatest care should be used in getting new and pure varieties of plants; never take from old beds, and get plants from those who use and know how to grow good plants; avoid new varieties with fancy prices, and use only the old and established kinds. Matted rows and hills have their advocates, and both are good—my greatest success having been with matted rows, as follows: Select a moderately rich

piece of ground, nearly level, and surrounded by high grounds, because the berry field will then get the wash of the surrounding land and catch the snow of winter, which is the best of all mulching material; plow deep and harrow level and fine, set out with a line and have the rows straight; have the plants tied in bunches of fifty, taken up with the full length of the roots. When ready to plant, dip the roots of fifty plants in water, and then distribute them along the line where they are to be set out; then with a dibble of iron or wood set them out as quickly as possible, putting the roots down full length, and press the soil about them. If land is scarce they can be planted closer each way.

What varieties to plant is of the greatest importance. In new and rich ground the Wilson is a good variety—one of the very best for shipping; but as a general thing it gives a poor yield on old land, if not well manured and provided with abundance of water. The Crescent seedling is the hardiest and most prolific of any variety known. By many it is considered a pistillate variety, but such is not the case; it is an hermaphrodite but too weak to be depended on as a perfect fertilizer. In all cases, in order to insure a crop every third or fourth row should be planted to some perfect flowering plant, such as the Wilson, Glendale or other hardy variety with perfect blossom. It is at home in all soils and localities, and if every third or fourth row is planted to the Wilson or Glendale it will give a large yield of fine fruit. Stick to old varieties, such as the Wilson, Crescent, Green's Prolific, Downer's; and on sandy soil the Countess. After the plants are set out and well started, the soil should be frequently stirred with a light cultivator with narrow teeth, that will keep the ground level and not hill up the plants, but if the plants are in perfect line but little harrowing will be necessary. When the plants throw out runners the cultivation should all be one way. In the fall when the vegetation ceases and there is a good stand of plants, there will be matted rows from one foot to fifteen inches wide with an open space between the rows. Mulch lightly on the first permanent fall of snow. In the spring rake the mulching on the open spaces between the rows and let it there remain. The second year about all that can be done will be to pull out the weeds and grass and plow up after the fruiting season. Failure often occurs by taking plants from very rich soil and transplanting to poorer. Plants should always be transplanted to richer soil to warrant success. In ordering plants a description of soil and condition should always accompany the order to an intelligent plant grower.

DISCUSSION.

President Smith. You have heard the paper read by Mr. Pearce. Discussion would now be in order. It is a subject that should bring out some discussion.

Mr. A. W. Sias. Mr. President, Mr. Pearce speaks of planting the Countess on sandy soil, as I understood him. I believe that a great many growers claim that the Countess is identical with Downer's Prolific. I have known of Downer's Prolific, or the Countess, to be grown on clay soil, where it proved to be very fine. I think perhaps that it stands next to the Crescent as to profitableness, but I would like to hear from others. If the Countess is the same as Downer's it will succeed on sandy soil. I would inquire of Mr. Pearce if he considers them the same?

Mr. Pearce. I have heretofore considered them identical but have changed my mind. After a careful comparison I think beyond doubt there is a difference. The Countess seems to be peculiarly adapted to sandy soil, although it also does well on high land and a clay soil. Mr. Wm. Lyons had very good success with it on sandy soil and he thinks there is nothing that equals the Countess. It is a very fine berry and ought to be generally grown. It is very hardy and the vines are free from rust, while the Downer is subject to rust; the Countess produces large berries, while those of the Downer are smaller.

Col. Stevens. Mr. President, I would like to inquire if anyone knows how the Countess was introduced into this state? A few years ago I was told that it was introduced by Chas. H. Clark, of this county, who received some ten or twelve plants from France, subsequently, or some years afterwards, Downer's Prolific was introduced; of course you all know about that. In the opinion of many members of the Society the Downer has been considered to be the same berry. I would like to have Mr. Elliot, or some of these early horticulturists, explain the difference in these varieties, if any of them can do so.

Mr. Pearce. Mr. Clark told me that he was in Washington and while visiting the Agricultural bureau he came to the department of strawberries, where he found many imported varieties. He saw one variety that appeared to be very promising and asked the gentleman in charge to send him a dozen plants. He afterwards received the plants marked as the Countess, imported from France.

Mr. J. S. Harris. Mr. President, I do not wish to join in any discussion on this question, but I remember seeing the Downer's Prolific some two years before Mr. Clark received the Countess, which I knew

of as he sent me some of the plants as soon as he could get them. I planted them side by side with the Downer and after keeping them two or three years allowed them to run together, as I could discover no difference, either in size of berry or quality of fruit. I believe them to be identical and also that they are a profitable variety for farmers to plant. I believe there is no more profitable variety. It was originated by a man in Kentucky who also originated the Charles Downing, a few years later. I agree with Mr. Pearce that there is no berry that can surpass the Crescent seedling in hardiness and productiveness; but if not properly fertilized it is inclined to be knotty or imperfect, especially after the first picking. I don't consider it the farmers' berry because it needs some other variety with it to fertilize it and they are usually too busy to attend to their proper cultivation. I do not quite agree with him that we should fertilize with the Wilson or Glendale; there is too much difference in the varieties as to the kind of soil required and the habits of the plants in order to have the best results. The Crescent will often bear heavily after it becomes partially overrun with blue grass or white clover; the Wilson will produce nothing under such circumstances. A heavy fall of snow is apt to smother the plants; if you set them you are obliged to set with some perfect blooming variety or your first setting of the Crescent will probably be a failure. With the Glendale I am not so well acquainted. If it blossoms as soon as the Crescent I am inclined to think it will be one of the very best. The Downer, or Countess, I believe upon all ordinary soils the very best to set in rotation with Crescent seedling. The color of the berries is about the same but the flavor of the Downer is a little bit better than that of the Crescent. I think it gives the best satisfaction to fertilize with the Downer; it is about as hardy as the Crescent. I have them growing on my place where I had berries seventeen years ago. And we get good berries there now; the plants perpetuate themselves. It is one of the fittest berries for the man that is too lazy to keep the weeds out. Speaking about rich soil, the Crescent on very rich soil will not produce as large a berry as on medium good soil; the berry is soft and destitute of flavor. There is probably no berry in our list that we have recommended that we want to be more careful in over-feeding, that is, when set on strong soil, such as I have, than the Crescent, if we want fruit that is of any value.

Mr. H. F. Busse. In regard to the fertilizing I would say that I do not agree with Mr. Harris. I have raised them and fertilized with different kinds, and I think on clay soil where the Wilson will do any-

thing it ought to be fertilized with the Wilson. The fruit is about the same as to firmness and color, and there is nothing that bears shipping better than the Crescent. But if fertilized with the Countess they are apt to be very soft; I think too soft to ship any distance. Fertilizing with Wilson you will find a great difference in that respect. I have some on the table there that one would almost call the Wilson; they are about the same in color, are firm and nearly alike in shape. I prefer the Wilson as the best to fertilize for that purpose.

Mr. Pearce. I want to add a word to what has been said about fertilizing the Crescent. It is the earliest berry we have and it is also one of the latest, and that is one reason why we can sell it to farmers. They need to be fertilized clear through their season; I would therefore fertilize with Wilson, Glendale and Downer's Prolific. I think we should never confine ourselves to one fertilizer but have two or three good varieties. The more you fertilize the better the berries. The Countess is good, the Wilson is good, Charles Downing is good, and James Vick is good. It don't hurt to put them all in, for if one misses another may hit.

Mr. Harris. I don't think it is best to have too many kinds in one patch if you are going to send your berries to market. At a certain meeting about a year ago I said that I thought it made a difference in the quality of the berry to fertilize with different varieties. From experiments I have conducted the past season I am inclined to think I was mistaken and that it is something in the air, or in the soil that makes the Crescents darker one season than another. This spring I set out Crescents and fertilized a section of the bed with Wilson, a section with Sharpless, a section with the Downing, a section with a variety that I procured in La Crosse that they call the Foundling, with Hart's Minnesota, and with another variety that I obtained at St. Charles; and on picking the berries and examining them I could not see any difference between those fertilized with one variety from that of another, and I don't think any one else can. This may be owing to the season. I am inclined to think that the influence of the male plant upon the other the present year doesn't have any impression. Those plants planted and fertilized with different varieties the progeny would be different; but of course one year don't settle this question any more than "one swallow don't make a summer"

Mr. G. W. Fuller. Downer's Prolific and Countess are very much alike. The Sharpless, of course, you detect anywhere. I have experimented a little with covering. Those that I covered came off the

earliest that I had. It seems to me that Mr. Pearce's direction for covering after the first snow falls hardly answers every year; sometimes we don't get snow until in January. We have to cover right away after the first freeze to amount to anything.

Mr. Pearce. I am inclined to think it is a mistake to put on the covering too early in the season, before the leaves are killed to the ground. From tests I have made with mulching I have found my best success has been with mulching on the snow in the middle of winter, or say in January. With strawberries the injury is not done in the fore part of winter but in the spring; I speak from experience and observation. I know of perhaps twenty beds of strawberries where the plants were completely killed by mulching last fall. The snow came on top of them and smothered them. If you wish you can mulch in the fall, if careful not to smother the plants.

Mr. J. C. Kramer. Mr. President and gentlemen: I would like to ask the question. What do we understand about this fertilizing the strawberry? Some say there is nothing of it. We cannot make them produce fruit by using manure or by working, but the other we can do; for example I have a seedling here that I have grown for several years. It is a seedling of the Wilson. I raised it for three years and didn't get any fruit although it was always full of blossoms. I didn't know anything about the habits of the plant, but finally got a catalogue from the east from a gardener, and there was a full explanation given of the difference in the blossoms. I examined my plants and I could see the difference. I found my seedling was a pistilate variety. So I went to another bed where I had what we call the Iowa King which has a full blossom. I took some of those plants and set them out with the seedlings, and I had the John Hart seedling on the other side; as a result I took twelve quarts of berries from a square rod at the first picking. Before this I had nothing but blossoms for three years. I had been fooled for three years. So I made me an implement out of an old cross-cut saw to transplant with, and I go to a row of full blossom plants and set one from them every eight feet; I take the plants up with that machine and set them right in and don't disturb the roots. I set the plants out in this way and got a crop. After that I took the Glendale and mixed them among a dozen kinds of seedlings and the fruit showed the effects and the berries were of the shape of the Glendale. We cannot understand it but there is a Higher Power above that gives us the blessing.

Mr. Harris. Did you pick Glendales from the seedlings?

Mr. Kramer. No; but there was a mixture of the two kinds. I have been experimenting and have perhaps 500 different plants. I have about a dozen different kinds of berries here; some that I set a year ago are now bearing. I have one seedling three years old that I think will beat the Crescent to death.

Mr. Harris. That machine which Mr. Kramer speaks of was made in this way: He took a piece of a cross-cut saw about five inches wide and had it bent in a circle but the ends not welded together. He has a piece of iron rivetted on where the two ends would come together and has a wooden handle. He can take up a plant with this without disturbing the roots; it is a most excellent plan for transplanting strawberries. It costs perhaps twenty-five cents to make if you can get an old saw blade.

Mr. Smith. I have fertilized a bed of strawberries in the same manner. In regard to the subject of fertilizing, I would say that I think there is a marked effect upon the fruit. I had a lot of Michigan seedlings which I fertilized with Wilson and Glendale, and if you could have seen them you would have been convinced that it had an effect upon the fruit. The seedlings were soft and light colored; those fertilized with Wilson were rounder in shape and darker in color and very much firmer; the same with those fertilized with Glendale.

Mr. Harris. Was that this year?

Mr. Smith. That was three years ago.

Mr. Harris. I think I was of the same opinion at that time and made a statement to that effect at the time. But I conducted a careful experiment this year and I wanted to take back what I said at that time.

Mr. Smith. I made some notes upon the paper read by Mr. Pearce. This matter of mulching in the fall or winter; as to which is to be preferred depends on circumstances. If plants are not standing very thick together and the ground has been cultivated late in the season it will be of advantage to mulch early; if plants grow thick together and the ground has not been cultivated it is as well to mulch in the winter. If the ground is clean and liable to crack—as much garden soil is—the plants will not be injured by mulching in the fall. In regard to fertilizing the Crescent. On strong clay soil I would recommend to use the Wilson as you cannot do any better. You cannot depend on the effect of fertilization from the fact that Crescents grown on high, clay soil would be much firmer and of much better color than if grown on a lighter soil and with plenty of rotted manure around them.

Mr. Harris. They would be darker in color also would they not?

Mr. Smith. Yes. In regard to this question of manuring the Crescent; if plants are close together, by manuring you will spoil the fruit. You can manure heavily by giving plants plenty of room. If you manure heavily enough and cultivate well enough to cause the plants to grow a foot high there should be a space of three feet for the plants to grow in. If the soil is poor they do not need so much space. But if the plants are a long ways apart you can manure heavily and cultivate. As to this matter of the Countess which we have discussed so often, the question of its identity is continually coming up. We have the fruit here and you will notice the pink shade at the stem which is more distinct than on the Downer, which always has a smooth stem. Is not that color an indication of foreign blood in this Countess? I think it would be well to settle the question as to whether they are identical. For farmers who have sandy soil it is the best variety we have, because it needs no fertilization and is good enough for anybody to eat, and as Mr. Harris says, it is good for years without any attention.

President Smith. If there is nothing further I would suggest that we hear from our former secretary, the commissioner for Minnesota at New Orleans, Mr. Gibbs. I presume the members would be pleased to hear from him.

REMARKS BY MR. GIBBS.

Mr. Oliver Gibbs, Jr. Mr. President and Fellow Members: It affords me pleasure to meet with you again, the old Horticultural Society, and to say a few words to you although I have nothing special to offer upon any matter under discussion. I wish to congratulate you, however, upon the thought that occurs to my mind, which I have found in the last six months to be well supported by facts, that although your Society is not large in numbers you have a reputation abroad in horticultural work that places you in the very front rank. Wherever I go I find the reports of the Minnesota Horticultural Society well spoken of; I find the labors of its older members well appreciated; and I find all the most advanced horticulturists who are looking to the interest of experimental lines in the development of new and hardy varieties of fruits, directing their attention to Minnesota and expecting to gain the most valuable information in those lines from the experiments that are going on under the auspices of this Society.

At New Orleans I did not find time, owing to the heavy pressure upon me in the care of the exhibits of the State, to spend any time whatever with the horticulturists in their special meetings. But I met them all from time to time in my walks about the exposition buildings. Most of them spent time examining our fruits and exhibits, and I learned there the views that I have expressed in regard to your position and reputation abroad.

Although my time, during this last year, has not been devoted as closely to the interests of this Society as I could wish, yet in my attention to other duties I trust that the horticultural interests of the State have not been neglected.

I think, gentlemen of the Society, that there was no question at New Orleans but that the Minnesota collection of apples was the handsomest and the largest and the best in the entire Exposition. In fact it was the only collection where apples were put up attractively and in large quantities in one exhibit. We had about two hundred bushels of apples to show there to represent our State—largely composed of our Wealthy, an apple which attracts more attention than any other variety in the world wherever you carry it. We put them up in large masses, in order that the admirers of that apple might see it in quantity and in its beauty as grown in the country where it originated.

It affords me much pleasure to say that the style of the exhibit made by the chief of installation, as devised by Prof. Porter, who sits here by my side, and who sketched out the whole plan of the Exhibit at New Orleans, was thoroughly artistic and well adapted to show all the varieties of apples that we raise here, to the best advantage. Massing our Wealthies for our large exhibits, we placed upon them and over them, for purposes of color, something over a hundred varieties of others, and there being some sixty bushels of them always in sight, made a very attractive exhibit.

Mr. Gould, to whose industry and that of his wife and daughter, we are mainly indebted for the show of the fruit and the care of it at New Orleans, has made you a most excellent report. I do not think I could add to that report, and I presume it has already gone into your Annual Report for the past year. I wish, however, here to express to the Society my thanks to him for the great industry, patience and perseverance with which he collected that fruit. To him is due the fact that we had so large and complete a collection. His services in that regard fully sustain the theory upon which he

was appointed, that was, that he was a man who would work faithfully and thoroughly, leaving no stone unturned to accomplish whatever he put his hand to and whatever trust he accepted. Let that be my testimony, then, on your records to the services of Mr. Gould; and as I have said before, to Prof. Porter, our chief of installation, are we chiefly indebted for the very attractive character of that show.

I wish here to emphasize the advantage that Minnesota gained in the display of her grapes at New Orleans. You already know that we took nearly all the premiums on single plates of varieties of grapes grown east of the Rocky Mountains. We did not get those premiums by mere chance or good fortune; but we had heavy competition; we had the Delaware from Ohio the place where it originated, and we beat Ohio with her own grape on her own ground; and we had many others of the most favored varieties of other States in competition with the Minnesota grapes, and although we had held them nearly five months after they were ripe before they were shown up for competition—that is to the middle of January—they were in fair condition, so that the committee did not hesitate to declare that upon the point of condition alone they were entitled to the premiums, and by comparison with the others, they were so far superior that they had a walk-away with the premiums. I think as it is stated in the report that we have eight first premiums on single plates and four silver medals on collections. I think our fruit display there has done a great deal to encourage people to emigrate to Minnesota. We do not claim that all the fruits that were shown there could be grown here profitably, but we presented them as evidences of the necessity and possibilities of fruit culture, and I think that all intelligent horticulturists that saw that fruit display were ready to agree with us, that in a climate where such fruits of such quality and beauty can be produced with the final success that we all hope for in the growing of apples, is something that is worth fighting for. I think any horticulturist, after seeing that display, other things being favorable, would be willing to take his chances in a country where it was possible to raise such fruit. This in view of the fact that apple raising as a business, compared with other products of the soil, might be some years at the foot and to come as the result of further experiments.

I make these remarks, gentleman, to indicate that horticulture and the Minnesota Horticultural Society received their full share of

attention in the large effort we made to represent all the industries of our State. Going there as I did the representative of the State Horticultural Society, if there was any department which more than any other I regarded as my pet department and wanted to see it at its best, it was the Horticultural Department. We did not give it any advantage over any other, as you are probably aware who have seen the reports. We aimed to carry the State to the top notch everywhere where we were in competition with others.

You are already aware that we established the reputation of our butter to be of a quality equal to the finest gilt-edge product produced anywhere in the world, although the improvements in the manufacture of butter have been so general that in these exhibits, where all parties are straining every nerve to get the blue ribbon, there is but a line of difference sometimes between the different samples, and judges have to figure very close to determine where the superiority lies. Still with all this to contend against and the closeness of judging, we were enabled out of the grasses, and water, and climate, and cattle, and skill of Minnesota, to get the award for making the best butter to be produced in the whole world. [Applause.]

And I want to say here for your satisfaction that there was no element of chance and no element of favoritism that entered into that award. I speak of this here for I think these two branches of dairying and of horticulture are more important to the country than any other branches of farm industry, and I believe I speak a fact that has not been published and am therefore excusable for introducing it here. To show how close those things were in that business of competition; it was the earnest desire of every person exhibiting at that exposition for premiums on dairy products, that the best experts in the world should do the judging, men in whom all had confidence; their success in the markets depended upon these awards and they wanted no foolishness in the matter. Hence business interests compelled them to agree upon judges of the very highest character. They sent for men and brought them there for that special duty whose reputation was as good for judging of the quality of butter as that of any stockman would be for judging of the points of an animal, so easily distinguished by the eye, and as those grand sweepstakes of the world, this gold medal, was so important they selected all of the packages in all the different classes that had received first premiums and placed them in a room together and then sent for that committee of judges and told them,

out of those packages to select the one package which they found on a close and on the most critical analysis to be the best. At the conclusion of their work they found two packages upon which they were divided in sentiment; and upon the closest test they found only one-half point of difference. Finally they agreed upon their award of the premium and then curiosity asked for the history of the package that they had selected. Giving its number they found that while they had given the grand award to Minnesota the one that was so near equal to it in merit was another package of Minnesota butter. [Applause.] And added to that the fact which was further ascertained that it was a package of Norwegian butter. [Laughter.] Let our Scandinavian friends about the State take that to their credit and the next time we get up an exposition let them add on another point and take the award.

Mr. Grimes. What was the "nativity" of the best package?

Mr. Gibbs. It was made by Wm. H. Patten of Le Sueur; the other by Mr. Olson of Spring Valley.

Mr. President, I have taken up too much of your time. I want to congratulate the Society (and I want your Secretary to be obliged to take down what I say,) upon your good fortune and your excellent judgment in the selection of my successor. I know him to be well worthy and qualified for the position, a good deal better qualified than the person that he succeeded, and I hope that he will be so enthusiastic in his work that he may assist greatly in developing horticultural work in Minnesota. I wish him every success.

Mr. President, I wish to say a word as to the plate glass transparency, or our pomological medal. We got it up to represent the work being done in the horticultural industry; it was very finely painted and was some three feet in diameter, and was intended to be shown to good effect by electric light; we found it looked so well that we never lit it up. I have the consent of the governor to turn it over to the Society.

REMARKS BY PROF. PORTER.

Prof. E. D. Porter being called upon for some remarks came forward and said: Well, gentlemen, an attempt upon my part to add to what Mr. Gibbs has said would be very much like attempting to add to Bunker Hill monument by putting dirt around its base; it would only tend to conceal the monument. But I will say as long

as you have called upon me a few words. You had me down for an address of welcome without any consultation with me, but that was not at all necessary, and I had intended to be here at two o'clock to-day to make that address to the strangers or members in attendance here at the meetings of the Horticultural Society. But unfortunately I was obliged to be at St. Paul at that hour to attend to some business connected with the State University, and was detained; consequently I could not be here at the hour you had indicated.

I will say in reference to the work at New Orleans that this Society is largely indebted for the reputation which the State has acquired at the Exposition, as well as at the meeting of the American Pomological Society at Philadelphia two years ago, to the energy and efficiency of Mr. Gibbs. These premiums have caused much remark. Why, they say, "How in the world is it that you men up there in Minnesota can do these things, where you have such a climate? If you get an apple once that has merit you want to blow it all over the world!" [Laughter.] Why is it, they say, that you can go to work and "scoop" the whole country? Well, the truth of the matter is, the credit for the taking of these premiums is largely due to the skill and care, and to the persistent energy of Mr. Gibbs. In the first place everything that was worthy of exhibition from Minnesota was gathered up by Mr. Gibbs and taken to Philadelphia. I won't say everything, but samples of nearly everything of value, were taken by him two years ago to Philadelphia and placed in competition with the fruit on exhibition from other States. It was handled very carefully and was shown in its height of perfection. And the result was that there was no other way but to give the first premium to Minnesota. It was the best fruit on exhibition there.

It was the same way at New Orleans. We had some two hundred bushels of apples to exhibit. We did the very best we could with what we had at our disposal. The fruit was very carefully selected and it was very carefully handled; it was placed in cold storage and kept in that state, no heat being allowed in the car except what came from a coal-oil stove; it remained in this condition for some two months till the opportune time came for the exhibition of our fruit; and I may say that this was against the persistent demands made that we should show our fruit at an earlier date. They wanted to know why we didn't put out our fruit and put it on competition;

if we had done so we would have lost all the premiums. But we kept the fruit in cold storage by the orders of Mr. Gibbs until it was taken out and massed upon our tables. And when our two hundred bushels of apples were taken out they were in just as fine condition as when they came off the trees. That is the secret of the success and it is due to Mr. Gibbs.

Now, Mr. Gibbs has spoken especially of the results of Minnesota's labors in the horticultural and dairy interests—but two of the great industries represented there. I wish to say that by common consent Minnesota had the cleanest and really the finest exhibit brought together there in New Orleans. It was the finest exhibit on the floor, representing all the varied resources and industry of our State. We did not go there to make a grand show of our manufactured goods; it was our resources that we wished to exhibit. It was the evidences of progress that we brought there, and we had the best in the Union by common consent; I think we had twenty-one separate and distinct departments in our exhibit. In all these we were able to take premiums of the first class where they were offered, where brought into competition, and where we did not enter for competition we had honorable mention.

Mr. Gibbs has related the manner in which they decided who was entitled to the grand sweepstakes and gold medal for the best butter in the world. That means something to Minnesota. I have made some investigation and I find that five years ago we didn't produce in the State of Minnesota one-half of the butter consumed within the borders of the State. At that time there were but three creameries in the State; while in 1884 there were over one hundred creameries in full operation in the State of Minnesota and we exported or shipped last year thirty million pounds of butter. That shows the rapid development of the dairy interest and it is becoming one of the leading industries of Minnesota. As I said at St. Paul last winter we have a soil which is most fertile, a location which by nature is fitted for stock raising and dairying, as well as being adapted to the growth of wheat, or the cereals. The fact that in five years we have been enabled to bring up the dairy interest from nothing as you may say to export an amount of dairy products to come in competition with the dairies of the world shows the progress that is being made.

There is another department in which Minnesota stood at the head and that was the educational. We were brought into competi-

tion with all the States of the Union and all leading countries, Minnesota was honored by being the only State that got the grand diploma for the best educational exhibit. France received a diploma but Minnesota stood at the head. In fact we stood head and shoulders above all other States of the Union. In our educational exhibits and educational work we took many other premiums. They were not given through favoritism, because I tell you it was a bad place to show any favoritism when we had forty-five States and Territories which were represented by shrewd, keen men and each just as anxious to excel as the other. I tell you everything had to stand on its own merits.

Mr. Smith. Prof. Porter, before you sit down I would like to ask in regard to the plants and trees received from Prof. Budd this spring?

Prof. Porter. If you will excuse me I will present a short report of our Experimental Farm to-morrow, and I shall be very glad at that time to make a statement of the work we are doing in that line.

Mr. Smith. We have had a communication here from Prof. Budd. You will recollect that at the last annual meeting a resolution was passed commendatory of Hon. Norman J. Colman. Mr. Gibbs has spoken of the influence of our Society and I think in justice to the horticulturists of the west and to Prof. Budd, we should pass a resolution commending his work; I therefore offer the following if it it would be in order:

Resolved. That it is the sense of this Society that Prof. J. L. Budd is doing a good work for the horticultural interests of the Northwest.

Resolved. That we respectfully ask the Commissioner of Agriculture, Norman J. Colman, to render such assistance to Prof. Budd as is necessary to secure to the people of the Northwest the full benefits of his work.

Resolved. That a copy of these resolutions be forwarded to the Commissioner of Agriculture and to Prof. Budd.

Prof. Porter, in seconding the motion for the adoption of the resolutions, said:

Perhaps it would be well to make a short statement of the work that Prof. Budd is doing. Perhaps some may not know the fact that Prof. Budd, in connection with Mr. Gibb, of Quebec, three years ago this summer undertook an experimental tour through Russia, for the purpose of making a personal examination and investigation of the fruits of Russia and their adaptation to the corresponding soil and climate of this country. They visited sections of Russia having precisely the same natural topographical

features as our Northwestern country embraces, Iowa, Wisconsin and Minnesota, Western Kansas, Dakota, and the country immediately west, on our high, dry plains. They found there what you will find described in their reports, and it is unnecessary for me to repeat it. They brought back with them as the results of their investigations a large number of the most valuable plants, cions, cuttings from the most promising fruit trees and shrubs, ornamental and useful, that were to be found. Prof. Budd took his collection to the grounds of the Agricultural College at Ames, Iowa, where they have had careful propagation during the past two years. They arranged for other trees to be forwarded and have received two consignments, one each year, and have been very successful thus far with them. I placed myself in communication with him to get a list of these trees, etc., for our own State. He promised to furnish me with a supply of everything that would be of value to Minnesota, as soon as we were ready to receive them and they were tested there. I was with Prof. Budd for several weeks at New Orleans and I made arrangements with him then. This spring I sent down and secured from him grafts and buds of everything that he had and he sent me a complete collection of all of his fruits, shrubs and ornamental trees and plants. I have those all set out, and nearly all of them are in fine condition, and in the course of another year we shall be able to make a report to you of their success in the climate of Minnesota. To-morrow I will furnish a list of what we have for the information of the Society. In consideration of the labors of Prof. Budd that he has been engaged in, of so much value to the country, I most heartily and cheerfully second the adoption of the resolutions.

Mr. Fuller. Mr. Chairman, I most cordially favor the resolutions. I met Prof. Budd last winter and had heard of him before that. He is a man of good common sense, and it seems to me he is engaged in a work that he is going to carry through successfully. I think very much of him and of his work. I received a year ago considerable many of his trees and this spring he sent me another lot, and the best that he has that are adapted to our climate. Many of those received last year failed this spring; those he said were of the Russian varieties. A good many killed to the ground. One pear I received a year ago came out nicely.

Mr. Busse. I would like to make a remark on the work that has been done by Prof. Porter, Mr. Oliver Gibbs, also Mr. Gould of Ex-

celsior, on what they have done for this Society. They have done a great deal especially in the line of fruit, and it is of more value to the Society than many may think. Their arrangement of the fruit in good condition and other farm products, and the care of it is worthy of praise especially what has been done by Prof. Porter. I think we ought to thank those gentlemen for the work they have accomplished.

Mr. Smith. I have known Prof. Budd for some twenty years and knew him before he was connected with the college at Ames. He was always a persistent worker in the interest of horticulture. He is a thorough horticulturist and has been all his life. I was very glad when he received the position he now holds in the Agricultural College. He has used the position to advance the cause of horticulture rather than the interests of J. L. Budd individually. Whatever assistance the Department of Agriculture can give him you may rest assured the people of the entire Northwest will derive the benefits from it as we could hardly expect from any other person in the Northwest. It is these considerations that lead me to urge the adoption of these resolutions.

The resolutions were adopted.

FROM PROF. TRELEASE, MADISON, WISCONSIN.

The following letter was then read from Prof. Wm. Trelease.

MADISON, WIS., June 25, 1885.

Dear Sir: I enclose copy of a somewhat rambling paper that I had prepared to read at your request at your meeting. I fear that it will be disappointing in the absence of specimens and diagrams. I regret very much my inability to attend the convention, which I know, from the program and the reputation of your Society, will be good. I trust, however, that I may enjoy the pleasure of meeting with you at some other time and beg to extend to you, on behalf of the Wisconsin Society our most hearty greeting.

Very Truly,

WM. TRELEASE.

Secretary Trelease had arranged to be present at the meeting but was unable to come owing to the meeting of the Wisconsin Horticultural society at Weyauwega on June 24 and 25.

Following is the paper furnished by Secretary Trelease:

A FEW COMMON APPLE FUNGI.

BY PROF. WILLIAM TRELEASE.

In preparing a paper to be read at a popular convention, like the present, I have assumed that the most satisfactory result will be reached not by giving an exhaustive account of one or more injurious species, but by speaking in general terms of a few forms which are so abundant as to attract general attention, without, however, going beyond the comprehension of ordinary observers.

Of late years the increasing damage inflicted upon our crops by the potato mildew, the grape mildew, the apple scab and a host of other vegetable parasites, has rendered every reader of agricultural journals, and, indeed, every farmer or orchardist of sufficient intelligence to look from effect back after cause, and to consult with his neighbors regarding both, familiar with the word *fungus*. Yet many of our most acute observers slip lamentably when they come to speak or write of these pests, for nothing is more common than to find the word fungus applied to anything from a gall on a horse to a knot on an oak tree, irrespective, even, of what a grammarian would call "number."



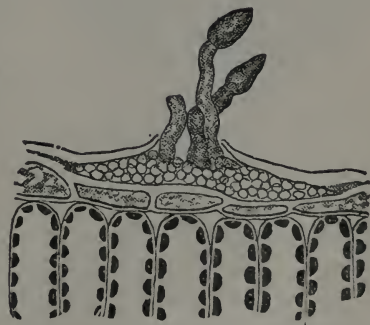
Famense leaf affected by *Fusicladium*
Natural size.

The word fungus, as properly used, indicates a plant of low organization, having nothing that can be compared with the leaves and trunk of a flowering plant, and entirely destitute of the green coloring matter (chlorophyll) to which the higher plants, and, indeed, many of the lower plants as well, owe their leaf-green color. As an English word, although it retains its Latin form, fungus should be rendered in the plural by funguses. To one with dull ears and a glib tongue this plural is proper, and a few of our brethren across the waters employ it. But the combination of grunts and hisses that it represents repels the majority of even those who hold that naturalization of a word, as of a citizen, carries with it the duty of conforming to all customs of its adopted country. For this reason the allowable English plural is

replaced, almost universally, by the shorter, better-sounding Latin plural—fungi.

No fact is better understood in vegetable physiology than that the chlorophyll or leaf-green of ordinary plants serves an important purpose in their nutrition. Without entering into the details of its usefulness, I may say that it acts, in a measure, as a tool, by means of which, using daylight as the motor power, the active portion of these plants (protoplasm) breaks some of the water which they obtain from the soil and the carbonic acid gas which they abstract from the atmosphere into their chemical elements, and reconstructs these bricks from the old structure into a new one available for plant growth. This new substance is starch or something very like it chemically, *e. g.*, sugar or fat. A plant containing chlorophyll is, therefore, able to make its own food from the air and soil; and it may be said with equal certainty that a plant destitute of leaf-green must obtain a very important part of its food from other sources. We know that starch, sugar, oil and woody matter (cellulose) do not occur ready formed, nor originate spontaneously in nature, but only where living protoplasm has acted—originally through the instrumentality of light and chlorophyll; and it therefore needs no demonstration to show why fungi, having none of this coloring matter, always live on organized material,—that is, on what is or has been part of some other living thing.

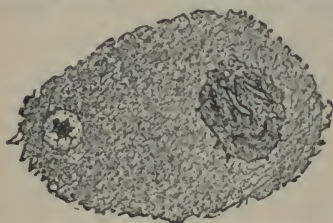
One of the commonest groups of fungi is that which includes the puff-balls and toadstools; and from what has been said it will be seen why these growths are found in well-matured pastures, on rotting wood, and in other places where organic matter is going to decay. Most of these plants are found on dead or decaying substances, but there are, unfortunately, a few exceptions to this general rule. I say unfortunately, because the only alternative is for them to grow on living matter, either vegetable or animal.



Section through a very small diseased spot of leaf, showing the fungus under the cuticle. Much enlarged.

A common sight in old orchards—far too common wherever the apple is grown—is the heart-rot or canker of trees, which, usually starting from some unhealed pruning-wound, insidiously eats into the very centre of the tree, up and down, until the once solid trunk is but a

shell, filled with powder, ready to fall before a puff of wind that would once scarcely have stirred its larger branches. This is the result of the slow but sure growth of a fungus which ordinarily lives and carries on its destructive work within the tree for years before it can be seen by the naked eye. How it lives may be shown by comparison with the well known process of cultivating mushrooms, in which, after a suitable bed of compost is prepared, bits of spawn are set as "seed." To the eye this spawn is nothing but turf or manure, traversed by a few mouldy threads; but from it the threads, which are the feeding organs (mycelium) of the mushroom, spread into every part of the bed, working over the crude, dead manure, until it is transformed into a part of their own substance, when they suddenly develop the growth that we prize for our tables. So, when a branch is cut from an apple tree, and the wound fails to heal over, a spore or reproductive cell, exceedingly minute, falls upon the wound and develops a mycelium in the healthy wood, on which it feeds until it has effected its work of destruction. Sometimes years pass before it shows itself in any form other than this microscopic growth; but ultimately, in some sorts of canker, it fruits in a form visible to the naked eye.



Scabs on Apple. Natural size.

Another common fungus of the apple, but one very unlike the toadstools, is that (*Fusicladium dendriticum*), which has attracted much attention of late years as the scab and leaf-mildew. To sustain its own life it needs the nutritious substances elaborated by the leaves, nor does it hesitate to freely take them; leaving the twigs weakened, to make a spindling, sickly growth, if they succeed in growing at all, as the season goes on, and with so little vitality that a severe winter, like the last, is fatal to them. The gnarled, cracked and blackened Snow-Apples that, alone, can be raised in many localities, testify with equal force to the destructive power of the same parasite when it seats itself upon the young fruit.*

Many orchards are affected by a white mildew that appears on the young leaves or, more especially, on the twigs. When in its most vigorous summer growth, like the mildew of the rose or the verbena, it well deserves this epithet, which, however, is less expressive than the German word that it corresponds to. Mehlthau—meal-dew aptly expresses the mealy appearance of the diseased parts, which are covered

*This fungus is discussed at some length in the Report of the Wisconsin Experiment Station, for 1883, from which the accompanying figures are copied.

by a dense white mycelium from which very many minute spores fall in the course of the season. This Apple mildew (*Sphaerotheca castagnei*) is more injurious than many of its relatives, since it does not confine its attacks mainly or entirely to the leaves, but settles at once on the twigs, which dwindle and die under its baneful influence. Like the other true mildews, this forms its snowy spores only during the open season, their place being taken, as winter approaches, by another sort of fruit, visible to the naked eye as small black dots, in which resting-spores are formed, capable of surviving the winter and further propagating the disease the following spring. Accurate observations on this parasite and its work and the results of experiments with sulphur, properly made kerosene emulsions and other substances destructive to it are much to be desired.

If time permitted, attention might be drawn to a considerable number of other fungi that live on the apple; some causing disease and death, others merely living on the dead portions, which they cause to decay. No less than thirty-one such species have been enumerated by an Austrian botanist. I think, however, that while this paper is of necessity very incomplete the subject has been carried far enough to show what some of the things we know as fungi are, and why, when they live as parasites on cultivated plants, they are as destructive as experience shows them to be. Knowledge of these minute beings is still in its infancy, and can be advanced only by the most painstaking scientific investigation, supported by intelligent observation and experimentation on the part of those who feel the need of such knowledge and will profit most by it. Let us trust, therefore, that in its pursuit the practical man and the scientist may join hands in harmonious work tending to the solution of these problems in which both are interested.



Section through edge of Apple-scab, showing the fungus in the epidermal cells. Much enlarged.

On motion the meeting then adjourned till 9 o'clock Thursday morning, June 25.

SECOND DAY.

THURSDAY, JUNE 25, 1885.

The meeting was called to order on Thursday morning at 9 o'clock, by President Smith.

REPORT OF THE SECRETARY.

Mr. President and Members: Since our last annual meeting we have been occupied a good deal of the time in the preparation and publication of the annual report of the transactions of the Society for the current year.

Necessarily this work has required time and attention. It scarcely need be said that much care has to be bestowed in the preparation of the copy for the printers, revising the same and the reading of proof.

The work of printing our reports was performed expeditiously and in a very satisfactory manner, the typographical execution of the same reflecting much credit upon the State Printers, the Pioneer-Press Company. If future publications shall be as well executed no reasonable ground can be found for complaint in this regard.

There was a delay of some three weeks in the issue of the present volume, as the last few pages were about going to press, from a failure in the supply of paper, which was this year furnished by the State.

We are pleased to note that the number of typographical errors in the work is not large, thanks to the pains-taking care bestowed by proof readers and pressman. There is certainly nothing so annoying to a careful reader as to see page after page disfigured with numerous errors which might easily have been avoided.

Owing to the compilation made in 1873 of the reports of previous years, this is the thirteenth report issued by the Society. It contains a few more pages than any preceding number but is still within the limit allowed by the law authorizing our publications. It was not deemed desirable by the members of the committee on publication and your Secretary to unnecessarily enlarge the size of the report, but it was found to be impossible to make a really creditable showing of the plans, work and discussions of the Society, together with a judicious selection of material of interest to horticulturists generally, without somewhat enlarging the size of our publication.

Our report certainly makes a very creditable showing for the Society and will compare favorably with those issued by similar societies in

our sister States. The volume will be found to contain fully as much original matter as the average of their publications, and as to its merits we will let it speak for itself, as comparisons might seem "invidious."

It should be the constant aim of the Society to improve its annual reports from year to year. As its members become more thoroughly informed, gain experience and learn more of the practical requirements in the varied departments of horticultural work, as pertaining particularly to Minnesota, they will the better be prepared to impart this knowledge, thus enlarging their means of usefulness, and the scope of their influence.

Aside from the routine report it will be seen by a casual examination that our field of investigation has taken a somewhat wide range, while at the same time many topics of a timely and interesting nature have not been considered, or even referred to. It will be the province of the Society to bring up some of these matters for profitable discussion and consideration in the future. But we will not detain you longer at this time with any extended remarks.

The following letter was then read:

REPORT FROM MURRAY COUNTY.

BALATON, May 5, 1885.

Dear Sir: Yours of May 2nd, 1885, came to hand yesterday. Am sorry to have to say that we have no Horticultural Society in our County, though I believe you think me to be a resident of Lyon County. My post office is Balaton, Lyon County, just over the line between Murray and Lyon. I am three miles from the county line and in Murray County. I am quite sure they have no Horticultural Society in Lyon County. They have a live Agricultural Society and with a little wakening up could keep up a live Horticultural Society in that County. As to our County I shall make an effort to have a society organized here this summer.

The few trees I have here have gone through the winter in very good shape. That is, the Duchess, Wealthy and all the crab varieties. My raspberry canes were dead down to the mulching, all varieties, even the Turner; but they were young plants. My plum and cherry trees are all right, I think. What I have said applies to the country around here. If we succeed in organizing a society I shall be very much pleased to report list of officers. With best wishes for our State Hor-

ticultural Society and those who by their untiring aid and support are keeping it up, I am,

Yours Truly,

C. F. NORWOOD.

The Secretary then read a paper on small fruits, by C. H. Hamilton, of Ripon, Wisconsin, Mr. Hamilton being unable to be present.

SMALL FRUITS.

BY C. H. HAMILTON, RIPON, WIS.

Mr. President. Having been requested by your secretary, to prepare a paper for your annual summer meeting on the subject of Small Fruits, I will endeavor to give you a few practical suggestions.

Small fruits, to people who live in the country are like heaven—objects of universal desire and very general neglect. Indeed in a land so peculiarly adapted to their cultivation, it is difficult to account for their neglect, if you admit the premise that Americans are civilized and intellectual. It is a trait of a savage and inferior race to devour with immense gusto a delicious morsel and trust to luck for another. People who would turn away from a dish of Wilson strawberries with their plump, pink cheeks powdered with sugar, or a plate of melting raspberries and cream, would be regarded so eccentric as to suggest an asylum. But the number of professedly intelligent and moral people who ignore the simple means of enjoying the ambrosial viands daily for weeks together, is so large as to shake one's confidence in human nature. A well maintained fruit garden is a comparatively rare adjunct of even stylish and pretentious homes. In June of all months, in sultry July and August there arises from innumerable country breakfast tables the pungent odor of a meat into which the devils went, out of which there is no proof they ever came. The cabbage patch may be seen afar, but too often the strawberry bed, even if it exists, is hidden by weeds and the small fruits struggle for bare life in some neglected corner. Indeed an excursion into certain parts of the country might suggest that many of its thrifty citizens would not have been content in Eden until they had put its best land into onions and tobacco. Of course there is little hope for the rural soul that does not love the manna of small fruits. We believe that humanity in the main has reached a point where its internal organs highly approve of the delicious group of fruits that strayed out of Paradise and have not yet lost themselves among the thorns and thistles. Living

without books and pictures is only a little worse than living in the country without fruits and flowers. Some perhaps have the delusion that small fruits are as difficult to raise as orchards. They class them with hot-house grapes. Others think they need so little attention they can stick a few plants in hard, poor ground and leave them to their fate; one might as well raise canary birds and kittens together as strawberries and weeds. There is a large class who believe in small fruits and know their value. They enjoy them amazingly at a friend's table and even buy some when they are cheap.

A little greater outlay, and a little intelligent effort would give them an abundant supply from their own grounds. But they usually go on from bad to worse until like their neglected strawberry beds they are turned under.

Some of you would like to have a list of varieties of strawberries which would be sure to meet all the recommendations of the disseminators. But in my own experience it is an almost utter failure to find in the different varieties all the superior qualities and adaptations which are claimed. Don't be too fast in discarding older and tried varieties for the newer and untried. I will not undertake to give you any suggestions as to what is best for you to plant. But when you do undertake to raise a bed of strawberries either for your own family use or for the market, prepare your ground with great care by having it well plowed and dragged, and by enriching it heavily. By close attention and good cultivation you will be able to get the cream or the only paying crop the first year, by forcing them in this manner.

I have never seen a bed of strawberries which I really thought paid the outlay of labor by endeavoring to revive it to the vigor and productiveness of the first year; better plow them under and cultivate the land for some succeeding crop. At this time of the year our only fruit which has ripened and once more graces our tables is so pleasing to our tastes, we are liable to want to dwell too long on the subject.

But what has been said of the strawberry, one of our most popular fruits, the principles of thorough preparation of the soil, culture, etc., apply equally to the other small fruits. Like the strawberry the raspberry is well connected. It also belongs to the rose family, and by many even preferred to all others. All people seem to have a feeling sense of the spines or thorns of this plant, as may be gathered from its name in different languages, as in German "kratsbarre" or scratchberry. While it is true that the raspberry in various forms is

found wild throughout the continent, and that the ancient gardeners in most instances obtained their supply of plants in the adjacent fields or forests.

The late Mr. A. J. Downing is of the opinion that the large fruited foreign varieties are descendants of the Mount Ida Bramble, and from that locality were introduced into gardens of southern Europe. All that has been said about the thorough preparation of the soil for the strawberry applies to raspberries with a few exceptions. Certain strong-growing raspberries, like the Cuthbert and Turner, should not be over-fertilized. Some kinds demand good clean culture rather than a rich soil that would cause too great a growth of cane and foliage. But with most varieties, I consider from my own experience, there is but little danger of over enriching the ground. By planting in rows six feet apart, and three feet apart in the row, give them a thorough system of cultivation, and a vigorous application of the pruning knife. When the plant has attained the height of about two feet cut off the top, it will cause it to branch out and form a well shaped tree capable of standing up of itself. I think it a good plan to plow a furrow up to the rows in the fall as it acts as a protector. As for the varieties, I think a man is safer in giving a list of the raspberries for general cultivation than he would for strawberries.

I will name over the varieties which have proved the most hardy with me, and will name them in rotation as to the time of the fruit ripening. The Hansell has proved the most hardy of any of the reds; Waterloo and Cuthbert next. Black raspberries, the Soughean, Ohio, Tyler, earliest; and along comes the Mammoth and Gregg; all are vigorous growers and productive. I find there is a great deal which might be said on the subject of the different varieties of the strawberry and raspberry and the different modes of cultivation. But there is one other small fruit that I would not like to be guilty of not mentioning. That is the blackberry, a fruit which is strewn over many acres of our state of Wisconsin, as well as of many other states; growing wild, and from which the greater part of our supply has been gathered by the natives and others and shipped to most every town and village which could be reached. The onward march of civilization and immigration has caused the supply to diminish as well as to recede further from the prairie towns.

As to varieties, this species has also an endless variety as well as those who advertise. Many of them are varieties of great merit in certain localities and wholly worthless in others. I will not occupy

your time in relating to you my likes and dislikes of each kind which I might name. But I will give some little history of my own success and of others in the immediate vicinity of Ripon, Wisconsin. The culture of the blackberry has become one of the first, and within the last twelve years the cultivation has extended from half an acre, till at the present time you can see something over fifty acres now in full bloom promising a large crop of this delicious fruit. The Briton or Ancient Briton which is the variety cultivated here with unparalleled success, was first sent here from Wales to an amateur horticulturist and after eighteen years' trial in different localities we place it at the head of anything that has been disseminated from any part of the country as a shipping berry or as to productiveness, and as to hardiness it will compare well with anything yet introduced.

It may be called the king of the blackberry; 4000 to 5000 quarts in about an average yield per acre.

The treatment required by the blackberry can best be understood by observing where, in its requirements, it differs from the raspberry and kindred fruits. It seems to do the best on light soils that are warm and well drained. The question is often asked, shall we manure the ground? Most certainly, as the blackberry luxuriates in a good rich soil as much as a crop of corn or any other crop.

More room should be given the blackberry than the raspberry. In planting for field culture, plant in rows eight feet apart and three or three and a half in the rows (some 8 by 4 in row) which will enable you to cultivate easily. They need to be cared for by cultivating and hoeing, the same as a piece of corn. The season being favorable, you will likely find that with a few exceptions you are progressing towards a foundation or start in blackberry culture, but after the first year is passed and you have every hill well established, comes the time which is of vital importance to the fruit grower. It then stands you in hand to look after and take care of the new wood, which is your promise for the fruit crop the next year. At this stage of growth they require support and may be staked or be supported by setting a strong stake at each end of the row, and at equal distances along the row smaller stakes opposite each other, and stretching a wire on each side kept at the proper height by a nail which answers for a support to the young bearing plants and for the new shoots, which, without support, are liable to be broken with wind.

The ideal treatment of the blackberry is management rather than culture. More can be done with thumb and finger at the right time

than with the most savage pruning shears after a year of neglect. Two or three feet is considered a fair average to stop the growth; it will branch out and generally become high enough if stopped at two feet.

Here it is necessary to protect the plants. Two good men will lay down and cover one thousand hills in a day. Beginning at the end of the row, we dig away a small quantity of soil on the side of the hill with a garden fork, which is less liable to injure the roots than a spade. We step to the opposite side of the bush, and placing one foot at the crown close to the ground and the fork in the top of the bush, we push lightly with the fork, and with the foot hard enough to bend the roots, not the tops. The other man then throws on the soil, and in less time than it takes to write this the bush is nicely secured and covered, ready for a long, cold, changeable winter. When spring comes, take a four-tined fork, loosen the crust, and placing your fork under the plant, carefully raise it up and press the soil back firmly. After the row is all taken up, string your wires at once if possible, and your plants are protected from the winds.

There is much more which could be said on this subject, but I will leave it with you.

DISCUSSION.

Mr. Harris. Mr. President, I met Mr. Hamilton last winter at the meeting of the Wisconsin Horticultural Society, and we had quite a long discussion on the subject of growing blackberries and he gave me a number of good points. I am beginning to be of his opinion, that the Ancient Briton is the best. I have been growing the Snyder because I believed it to be more hardy, but it is more difficult to protect, the canes are stronger and it has more lateral roots. Mr. Hamilton recommends covering the blackberry canes by digging down to the lateral roots and bending the canes over to the ground and putting earth on them. On account of sickness last fall I did not protect mine in that way. I have the Snyder, Ancient Briton and Stone's Hardy. The Ancient Briton blossomed the most, Stone's Hardy the next, and Snyder about one cane on a quarter of an acre; Ancient Briton was full as hardy as any of them.

Mr. Pearce. Did you cover with earth?

Mr. Harris. Mr. Hamilton covers with earth; Mr. Lord also does the same. They put the protection on very loosely that they cover the canes with; the main thing is to hold them down to the ground;

it is a simple operation. I went to Mr. Lord's and witnessed the operation. Where they are covered in this way they start a week sooner and grow better than where unprotected.

Mr. Pearce. I have been growing the Ancient Briton for five years. I have lost a great many plants without covering them, but where I have covered them they have done remarkably well. The past winter is the first I have paid attention to covering as I have grown them for plants more than for fruit. But I was told a year or two ago that it was not necessary to cover with earth, and I thought I would experiment and ascertain whether that was correct or not. Last fall after the wood was thoroughly ripe I bent the canes over to the ground and laid weights upon them—a stone, chunk of wood, or earth—and this spring straightened them up and never saw a better prospect for an immense crop than at the present; so I think the covering with earth is entirely unnecessary. I tried the same thing with roses. I tried it with the Ancient Briton blackberry on different kinds of ground, in every instance they came out in the greatest perfection; they are at this time just loaded with fruit. I shall experiment further and if I find the covering with dirt unnecessary I think it will be a great improvement. They were in exposed places and they came out in perfection without any other covering whatever.

Col. Stevens. Mr. President, it is a well known fact that in the backwoods where Mr. Pearce's grounds are, the wild blackberry comes to great perfection. It is very probable that the Ancient Briton, which is no doubt, a species of wild blackberry, would do well on his grounds when they would not succeed on the open prairies. On that kind of soil where there was no protection by snow they might be destroyed. We had a communication from a gentleman in the interior of the State who has had experience with Stone's Hardy, and he stated that it grew to perfection with him and was a most hardy and valuable variety of the blackberry; the past winter they came through without a terminal bud being injured.

President Smith. There was a good deal of snow the past winter and that may have served for a protection.

Col. Stevens. Yes, and I think Mr. Pearce's grounds are favorably located.

Mr. Harris. I do not think on my place there is a necessity for covering with earth one winter in twenty; but out on the prairie I think the earth covering would be well. Down in the valley all you need to do is to get the canes down to the ground and they will take care of themselves.

Mr. Kramer. My Snyder berries froze down to the ground, and that portion which had naturally fallen down and laid flat on the ground, came out all right and the bushes are now just loaded with berries; the canes which are an inch or more in diameter are all gone, but the small limbs which were on the ground were saved.

Mr. Harris. I had a similar experience with grapes, the vines that lay upon the ground were not injured, but I did some pruning in November before the ground was covered with snow, and among those a good many vines were killed almost to the ground. That indicates that there must have been injury done before the extreme cold, before the time when the thermometer went down into the thirties below zero.

Mr. Kramer. I have grape vines, I think, four inches in diameter which were frozen clear to the ground. I have some seedlings that are good grapes, and I laid some of the vines on the ground and they are full of fruit at the present time, but everything that has been up three or four inches in the atmosphere is all gone.

Mr. Pearce. I did not make the suggestion to recommend the practice as I expect to try it a little further. I have Concord grapes that kept to perfection without covering, by simply laying the vines upon the ground.

Mr. Kramer. I think they will; the soil keeps them from killing. If they are on the ground it makes no difference how cold it is; there is where they want to be.

Mr. Pearce. I think it well for the Society to experiment on these things. I tried the same thing with roses and am inclined to think they will keep if laid flat on the ground.

Mr. Harris. I have two of the Prairie Queen rose bushes; one of them my wife asked me to take down early in the fall, and I did so; the other I did not lay down until about the first of December; that was entirely dead in the spring, while the other was perfectly sound. It ought not to have been cold enough to injure it, but I think the portions that were exposed when we had our first freeze must have been hurt.

Mr. G. S. Woolsey. That is not my experience with the rose bush. I have prairie ground and the snow blows off; I cover the bushes and in the spring take them out and they are bright and clean; where they are exposed they are bright but dead.

Mr. Elliott. My experience in covering is this: whenever we get plenty of snow that will ordinarily cover them and keep them from

freezing, we do not have any trouble, if you only lay a few boards or sticks over them, but if they are in exposed positions where the snow blows off, your vines or bushes will be more or less injured. I think the proper way is to lay them down and cover them with sawdust, just enough to keep them from getting exposed; I think that is the surest plan. I have adopted it with raspberries and roses and it has been a perfect success this year, at any rate.

Mr. H. H. Young, of St. Paul, being present, was called upon to read a paper. He stated that he had been unable, from a press of other duties to complete a paper in time to present it at the present meeting, but would prepare a paper for the Society.

Mr. Harris moved that Mr. Young be requested to complete his essay and furnish it for publication in the transactions of this Society. Carried.

FRUIT REPORTS.

Secretary Hillman presented the following report:

Mr. President and Members: We desire to offer a few suggestions which have come under our observation, in regard to the present condition of fruit trees.

On the first day of the present month of June, we had the pleasure of visiting the orchard of a worthy member of our Society, namely, Vice-president Dartt, at Owatonna, and will give a brief description of what we saw while there.

Mr. Dartt has a very pleasant and inviting location, and for many years has taken great pains in caring for his orchard and nursery stock. Upon inquiry he assured us that the prospect for a fruit crop this season was not encouraging, as the past winter had been much more disastrous to the trees than he had at first supposed. He said that he was not disposed to despair entirely of success at fruit growing, and would continue his efforts in this direction. He expressed grave doubts, however, of the successful and profitable growth of standard fruits, and intimated that he should rely more than ever, hereafter, upon the crab and Hybrid varieties. He said further, that the past winter had been the severest he had ever experienced in this State, that a majority of his standard trees were more or less injured to the snow line. In proof of his assertions and conclusions Mr. Dartt invited us out to take a stroll through his somewhat extensive orchard and nursery grounds. On first going into his garden, we were shown a fine specimen of Hybrid seedling of Mr. Dartt's own propagation, a thrifty ten-

year old tree, then in full bloom, and apparently uninjured. He stated that this variety was grown from a Tetofsky seed, probably crossed with the Hyslop crab, the fruit of which it resembles somewhat, both in size and general appearance. This same variety stands well in the nursery, the trees appearing thrifty and showing very slight injury. We noticed here a large Duchess tree which had been utterly ruined by the protection afforded from a building which stood on the north side of the tree; from which he concludes that any protection from the north is worse than none at all.

In the orchard we found Yearl's Winter, badly affected. He remarked that it had heretofore given considerable promise as a hardy winter seedling, but he now regards it as worthless, and should never again recommend it to favorable consideration.

In his orchard of Duchess and Tetofsky, of seven or eight acres, most of the trees show marks of injury. The larger portion of the Duchess trees have been set some fourteen years, proving heretofore hardy and productive, while now many of them are killed outright and others are so much injured that they cannot fully recover. His mode of culture has been to plow the ground between the rows spring and summer, manuring or mulching heavily near the body of the trees as a protection from the cold. He regards the Duchess and Tetofsky as the only well known standard varieties worth cultivating in this climate; although a few of the Russian varieties promise equally well, others are more or less injured.

With Mr. Dartt quite a number of the crab varieties are apparently hardy and will produce fair crops of fruit this season. The best of these are Early Strawberry, Transcendent, Orange, Beachs Sweet and Hutchinson's Sweet. Whitney No. 20 is a good deal injured, or semi-hardy. As the Transcendent blighted in former years, he had, he said, on the recommendation of the State Horticultural Society, planted the Haas quite freely, but the experiment had proven abortive. The Greenwood crab seems to be a promising variety, fruit of good flavor, size of the Transcendant, the tree a constant bearer and very hardy. The Peach apple is also a hardy tree but a shy bearer. He favors the crab family generally, but says many varieties are good for nothing. The Maiden Blush, for instance, is an early bearer, a good apple, but the tree dies early; the same with Minnesota. Hutchinson's Sweet, a very fair sweet apple, is a poor bearer.

Mr. Dartt also has a young orchard one mile distant from the city, containing some three thousand trees in which he had set five hundred

Duchess this spring. He considers this variety our main dependance for standard fruit, at least for the present. His Wealthy trees, both in orchard and nursery, were pretty nearly all killed to the snow line; hence he does not recommend them, and will plant no more of them.

On the third of June we visited the orchard and nursery of Vice-president Sias, at Rochester. But as he is present we prefer to have a report from him in person.

Mr. M. W. Cook, of Rochester, informed us that his trees were badly injured by the past severe winter, but he gathered consolation from the fact that in Missouri, from which State he had recently returned, the fruit trees had been nearly all destroyed from the severity of the past winter; an illustration, perhaps, of the adage that "misery loves company."

We also met Mr. F. K. Phoenix, of Delavan, Wisconsin, at Rochester, who reported sad havoc to the trees of that locality, especially with the so-called Waupaca Seedlings, among which is the Wolf River, or Alexander. He expressed the opinion that hardy new seedlings must be sought out as our chief dependance for apples in the future, both of Russian and native varieties.

Mr. A. W. Sias, of Rochester, was then called upon and presented the following report:

OUTLOOK FOR FRUIT.

Mr. President and Gentlemen of the State Horticultural Society:

Perhaps there is no being more commonly and grossly misrepresented than the Supreme Being of the Universe. Just after the winter of 1872-3, a preacher of the Gospel said to me, "Well, Mr. Sias, the Lord has killed all the fruit trees, but it will be just as well for *you*, as they will buy and fill right up again." It perhaps did not occur to him, that it would bother me to furnish live trees to fill up with, in a country where they were all dead. And farther, that if I shipped them in from a more southern clime, that *others* like *himself* would have too little confidence in the pleasure that the Ruler of the Universe is said to have in "giving good gifts to his children," to purchase so extensively as to make it as well for me as before. Another man said to me on the street at Rochester, not long ago, that "the fruit trees in the country were all killed—wood literally killed to the bark." This is true as far as the wood of the Duchess is concerned in southern Minnesota, and a most severe test of my doctrine that a "Black hearted

tree" is not wholly worthless. Providing the Duchess matures any considerable amount of fruit this season, then we are all forced into the knowledge that a "black hearted tree" is sometimes valuable, and also into the old doctrine that "a tree is known by its fruit."

During the last two or three years the fruit grower of our part of the State has had many trying obstacles to contend with. July 21st, and then again August 21st 1883, we were visited by the two most destructive tornadoes ever known since the first settlement of the State, which killed many trees outright and badly injured many others. Anything that lessens the vitality of our trees appears to increase the number of insects. The same as in the animal kingdom, before life is fairly extinct, insects assert their claim, and take full possession immediately after. I am of the opinion that in the wake of these tornadoes over one-half of the fruit has been literally destroyed up to this date, by insects of various kinds. The need of a competent State Entomologist is imperatively demanded.

Now for the bright side of this subject. We are told that every family upon the face of the earth were drowned, at one time, except one. An innumerable host is the result of this one family. In like manner, if the past winter had killed all the fruit trees but one family, from that we would soon replenish the earth, but thanks to a kind providence we are driven to no such straits as this. We find among the Russians, the Anis, Transparent and some other families that came through last winter almost unscathed. Also many native seedlings just as sound—I refer here more particularly to the seedling hybrids. Many Wealthy trees were killed in some locations, still I continue my faith in it for good locations, and on the whole I see no good reason for discouragement. The De Sota, Minnesota, Quaker, Wild Rose and Weaver Plums, never looked better. Small fruits are looking splendid.

Mr. Smith inquired if Mr. Sias had seen the Brett seedlings this spring.

Mr. Sias. I have not; I have seen the owner of the trees and he stated that they were apparently uninjured.

REPORT OF J. S. HARRIS, OF LA CRESCENT.

I have no written report, but I merely wish to state that in the last twenty-nine years, that I have spent in Minnesota, the last one was the most disastrous of any to fruit trees. The St. Lawrence trees that I set out twenty-nine years ago are badly whipped; also the

Wealthy; so much so that but two trees on my place will bear this year. The old varieties which produce such fine fruit, which I used to exhibit at our fairs are practically dead, and it don't seem possible that they can recover. I have had some Russian varieties a short time and have four or five that are not injured to any serious extent. The Duchess is not seriously injured; last year's growth was killed back some two inches. I am not, however, entirely discouraged; as soon as I found out the injury that had been done to my trees I resolved to go on again, and I shall continue my efforts in trying to grow apples in Minnesota. The very difficulties we have to contend with are going to help us the sooner to get a hardy variety. We have met with reverses, and every time it seems to be worse. But I tell you we are going to raise our own fruit, and have enough and to spare; we are going to find Russian varieties, I think, that are hardy; we may not find them adapted to all seasons of the year and every portion of the State; but, we are going to keep planting until we get what we are looking for.

Small fruits in our part of the State are doing well, especially strawberries and grapes. Raspberries in places were killed down to the snow line, which means ordinarily, within three inches of the ground. Blackberries were also killed that were not protected. Everything seems to be favorable for fruit. I find much interest manifested among those who have been growing fruit long enough to raise it and they are replanting and carrying on the good work. I saw one man who had been growing trees for twenty-five years who wanted to buy some trees and when I showed him the dead trees, he said he should plant more of them and keep on trying. That seems to be the feeling among the members of our Society, and to my mind it indicates that we are doing a good work.

Mr. Fuller. The Transcendents which some persons have been trying to drive from our State are about the only trees that stand uninjured in our section, north of the Big Woods; that stands very well. The wood is colored a little as is nearly every fruit tree in Minnesota; but it looks healthy. Usually the trees hang full of fruit. Next to the Transcendent in hardiness is the Orange; Minnesota and Beachs Sweet stand pretty well. Hutchinson's Sweet as a tree is hardy but does not bear any apples and I dug up the last of mine this spring. Whitney's No. 20 is hurt some but not very badly. I received about twenty Russian varieties a year ago from Professor Budd. A part of them killed to the ground and a part of them stand. I have a seedling

crab which is the least colored of anything I have seen—probably a seedling of the Transcendent, and the fruit a little larger; probably not much more valuable if any, than the Transcendent. Small fruits are all one could expect. We can do nothing up there with blackberries, except by laying them down. Raspberries were hurt a good deal. Currants, gooseberries and strawberries are a very fine crop.

Mr. Kramer. Mr. President, I had a letter from the Secretary asking me to give a report of my seedling apple trees, and as I had no time to write I thought I would not make him the trouble to read my poor writing or write it all over again for me. So I was induced to come up myself and I will give you the report so far as I can. I sent the Secretary this spring some specimens of my seedling apples. I generally think that one can tell more by the taste than by the looks what fruit is good for. I have been sowing seed for a good many years and have received a good many apples, but must say to you that the nicest ones are entirely gone I think. Three or four trees are coming out, I won't say all right, but within the last two weeks have commenced growing and I think will recover. I have half a dozen younger trees that look well; some of the shoots have grown a foot and a half. They were hurt worse than I thought at first. Of the older trees there is not one that has recovered except the crabs, and the Duchess and Tetofsky, of course; the crabs I don't call apples. It is our duty to go on and try again; if one tree kills out we should set another and after awhile we will succeed, that is if we all try. If we plant the good seed, as the scripture says, the same with the apple as with the strawberry, we will have an apple and a strawberry for our use after awhile. The older trees are all gone, and we can't depend on the Duchess and Tetofsky. The apples don't keep long enough; they only keep long enough to take them from the tree into the mouth, and that is the last of them. We must try and find something better.

Mr. Pearce. I would like to say one word in regard to a fruit report. I don't suppose there is anyone more interested in fruit growing in the State than I am. I had as fine an orchard as anyone and had about 4,000 trees and which I valued at five dollars a tree. Fully two-thirds of them are virtually dead and the prospect is not encouraging. At the same time those trees, many of them, will recover and produce fruit. They are reviving and I find that young shoots are coming up which in three years will bear fruit. I have probably 200 seedlings and nearly that many varieties. Among them I have one variety of excellent quality that fruited last year; it is early and

one of the best. It received the highest premium at the fair. The tree is green to the very top and not a bud was injured. I have several other varieties, not injured a particle, as well as several Russian varieties. We can graft upon these young shoots and we will soon have a better orchard than ever. Where my Wealthy trees died I shall graft with varieties that I know will stand, and if my life is spared three years my loss will more than be made good. We need perseverance and determination when we fight against the elements. The Almighty has given us a mind that is capable of endless improvement, and we can surmount all these difficulties, but if we submit and become discouraged we shall fail.

Mr. Kramer recommended growing trees from the roots instead of the ordinary method of grafting.

Mr. Sias said a very good way to graft trees was by budding.

Mr. Kramer. This is not alone for the nurserymen. I have an interest in this myself. I do not see any use in budding or grafting the way they do it. The cion from the tree does not start to grow in that way, it comes from the root. You take the roots and you can grow your trees from them; keep them from freezing in the winter and in the spring they will start out and come right ahead; so that in May you will have a tree that you can set out and will make a good growth the first year. What is the grafting for? You take the roots from one tree and put another piece of wood on to it; why don't you take the root and set that out? You would not take a part of one child and put it upon another, to make two children. [Laughter.]

Mr. Harris. One advantage from Mr. Kramer's method of propagating is probably very poorly understood by the mass of people. One difficulty in grafting with cions is caused by an imperfect union which causes injury to the tree. It looks reasonable to conclude that a tree upon its own roots will grow the most natural, and it will undoubtedly grow more rapidly and be longer lived upon its own roots.

Mr. Sias. If I understand Mr. Kramer's idea, it is to propagate from the roots, which is probably the nearest approach we can get to a seedling; it would naturally be a longer lived tree than a grafted or a budded one.

Mr. Kramer. If you take these sticks in and keep them through the winter they will naturally heal over; you set them out and the upper end is unhealed. In time the warm weather comes and causes the roots to start. It is the simplest to grow your trees in the way I have stated.

CONGRATULATORY TELEGRAMS.

Mr. Harris stated that the Wisconsin State Horticultural Society was now in session, and moved that the Secretary be instructed to send a telegram of greeting to the Society. Carried.

The Secretary sent the following telegram:

MINNEAPOLIS, June 25.

Minnesota State Horticultural Society in convention assembled, sends greeting to the Wisconsin Society. A grand display of strawberries, and members are enthusiastic.

S. D. HILLMAN, Secretary.

REPLY.

Later in the day the following reply was received;

“WEYAUWEGA, June 25.

Wisconsin Horticultural Society in session with the Weyauwega Society, receive greeting from the Minnesota Society and return the same. Come and see our Wolf River apples.

B. S. HOXIE.”

LETTER FROM PROF. BUDD.

The following letter was received from Prof. J. L. Budd of Ames, Iowa, under date of June 23:

Mr. S. D. Hillman—My Dear Sir: I have just returned from the nurserymen's convention at Chicago. I find that the old sorts of trees are mainly dead through to Lake Michigan; only the Russians and the crabs are really alive at Waukegan, Ill. My old forty-acre orchard in Benton county is wholly dead, except Duchess, Wealthy, Plumb's Cider, Gros Pomier and the crabs, and all except the Duchess and the crabs are sadly hurt. It will pay the State of Minnesota to send a man to Eastern Russia to forward cions. Any variety of apple, cherry or plum doing well in the province of Limbursk and Kazan will live with you as well as box elder. But many of the sorts of Central and Western Russia will fail to stand your test winters. It is impossible to get cions or trees from Eastern Russia without being on the ground. If packed there by inexperienced parties without moss—there is no moss there—they always get used up by their four months' voyage.

We are most anxious to get the varieties of the black soil sections of Central Russia, say of Oreal and Varouesk, and for Southern Iowa down to Koursk.

Yours,

J. L. BUDD.

THE LEAF-ROLLER.

President Smith. One of the objects of our summer meeting is to discuss small fruits. There are many insects which prove injurious to small fruits and I would like to have the experience of some of those present in regard to the leaf-roller, which has done a good deal of damage in some sections.

Mr. Oliver Gibbs, Jr. being called upon came forward and said:

Mr. Gibbs. About all the information I could give you is as to the destructive character of the pest, and so far as that is concerned I think you already have about all the information you want. I had experience with the leaf-roller two years ago; they were all over my strawberry beds and I had three or four acres planted. On one-half acre they destroyed the whole crop. I mulched my strawberries with fine straw taken from an old ice house. In the spring I noticed very early that the birds were digging over that straw. I examined and found where they had searched for these insects, going some six inches down in the straw sometimes. The following season I discovered hardly any signs of the leaf-roller, and I think the birds took them. I do not know of any artificial remedy whatever. It is the most destructive pest I think, that ever infested strawberry plants.

Secretary Hillman here referred to remedies recommended in the report of the Missouri Horticultural Society, exterminating the leaf-roller by mowing and burning the leaves in mid summer, etc.

Mr. Busse. Do they deposit their larvæ in the ground in the spring?

Mr. Gibbs. The insect hatches out in the spring and is about a sixteenth of an inch in length, and commences its work after warm weather begins. It weaves a web consisting of little bars, across the stem or leaf of the plant, and the leaves commence to fold together. It weaves its way along until the leaf is entirely folded together and after it is closed no poison can touch it unless it is strong enough to kill the plant. Ordinary solutions of Paris green have no effect. It has been said that the burning of the fields in the fall or spring has proven of benefit. I think Prof. Forbes reported to our Society that they had tried it in Illinois and it was the only effectual remedy they had ever used. The worm changes its form and becomes apparently lifeless; it eats its way through the leaf, drops off and buries itself in the rubbish or mulch on the ground. There seems to be a period when it lies among the vines or rubbish, when they can be destroyed by burning; but if not destroyed it remains near the surface of the soil and comes out in the spring. Of course it changes its form to a fly

which deposits eggs which in turn are hatched out, thus performing the various evolutions of insect life.

Mr. Busse. Some three weeks ago I noticed small worms upon my plants that were very numerous and I thought perhaps they were the leaf-roller, but they were much smaller.

Mr. Gibbs. This insect when in the form of a pupa eats holes through the leaves. Here is a leaf which has one of the insects inside. You can see it by opening the leaf. [Illustrating.] There he is, a very lively little delegate; if you are going to catch him, you have got to be spry.

Prof. Porter. In reference to the leaf-roller, I would say that I have had a little experience which may be of interest. Two years ago this last winter I had a very fine bed of Wilson's Albany, Glendale, Crescent Seedling and Minnetonka Chief; they were in very fine condition and growing in hills. I mulched the plants; the rows were four feet apart—plenty of room. As the ground was very light or sandy, I thought I would mulch heavily with well-rotted manure so as to protect the plants through the winter. In putting on the manure the outer edges of the bed were not covered. The next spring as soon as the plants began to develop I found the leaf-roller on every single plant, so thick in the body of the bed that the plants were all destroyed; in the outer borders where the mulching had not extended, there were very few insects, and the plants were alive and vigorous while all the rest of the bed of plants was entirely destroyed. Last spring I commenced an investigation of the habits of this leaf-roller. Not knowing that the subject was coming up for discussion I did not bring my notes with me; but this fall, at the State fair, I will show you there the insect in all stages of development; I have them prepared and mounted, but have not the notes of the examination with me.

THE UNIVERSITY EXPERIMENTAL FARM.

Mr. Busse. I understood that we were to have some remarks from Prof. Porter about what he is doing on the Experimental Farm.

Prof. Porter. Gentlemen; this Society is one of the associations of the State, which is entitled at every annual and semi-annual meeting to a report of what is being done at the University Experimental Farm.

You are well aware that five years ago when I took charge of the Department of Agriculture at the State University, I found it in

possession of a farm of 120 acres, within the limits of the city of Minneapolis. At that time, I was a stranger to the soil, a stranger to the climate of this State, and a stranger also to its wants. I contented myself the first year with carefully looking over the grounds and taking notes. I found at the end of that season that we had a farm totally unsuited for the purposes for which it was designed; there were not two acres of ground in the whole 120 acres contiguous to each other, of the same quality of soil; there was not one-fourth of the 120 acres that would bear the weight of a horse; you could jump up and down on three-fourths of it and shake the surface for a distance of fifty feet around you. [Laughter.] It was either a quagmire or a sandhill. In addition to this, it was unfavorably located. It was contiguous to our city; it was being surrounded by the great improvements which are being carried on in our rapidly growing city of Minneapolis; it was being cut up by the great lines of communication between St. Paul and Minneapolis, and I saw that in the course of a few years more it would be totally unsuited for our wants, even though the soil was suitable for our purpose. I therefore condemned it as being unfit for the purpose of an experimental farm. The Board of Regents authorized me to make any selection of any farm in the State of Minnesota, that I thought would be suitable for our purpose. I had in the meantime been examining different localities, and particularly the situation of a farm midway between Minneapolis and St. Paul, the first purchase embraced 155 acres and at the close of the first season we purchased about 100 acres more. This land adjoins the new State Fair Grounds, and is most conveniently located on Como Avenue. It contains within its enclosure every variety of soil that can be found in this country—from a brick clay on the one side to drifting sand on the other. A portion of it is just as fine a soil as can be found on the face of the globe—all that we need; and we have got just as little poor soil as can be found within the limits of our State. We have on that farm every exposure, north, south, east and west; we have lakes and meadows, hills and prairies; we have everything that is desirable excepting running water; but we cannot find all the advantages in one place. We supplement that deficiency by sinking a well 170 feet deep and throwing water, by the use of a windmill and by power, on to an elevation that enables us to distribute water over every foot of the ground and on the top of every one of our buildings.

This land was purchased, and two years ago this spring I took possession of it and commenced the erection of our farm buildings.

We have not completed all our buildings, but we have two main buildings up, the farm house, its offices and appliances, and the farm barn. I pronounce both of them the best buildings of their kind in the United States; I challenge contradiction and examination. We have not yet completed the barn, but the work is now going on; I found the farm had been run continuously in wheat and oats ever since it was taken up by the first settler. I took off last year the nineteenth crop of continuous grain, there was no grass of any account upon the farm. Now we have about one hundred and sixty acres seeded down that will yield two and one-half tons of hay to the acre. A good deal of it was in black oak grubs, and a portion of it so thickly filled with underbrush that a bird could scarcely pass through it. There was not a panel of fence in good condition on the farm and all the line fences were covered with underbrush. My work thus far has been mostly foundation work; in the first place to get our hedge rows cleaned out to get the ground fitted for cultivation; grubbing, plowing and seeding down to grass, and to prepare it for keeping stock; to get our farm buildings erected and get in condition for experimental work. I found the fields completely overrun with everything that was vile and noxious to the farmer. One year ago in passing through the fields on a portion of the place, you could not tell whether we were growing oats, wheat or wild mustard for a crop, but the wild mustard predominated. Our fields were so filled with wild mustard, with wild peas, with wild oats, that we could not grow a single bushel of grain fit for seed purposes. Now, we have commenced a system of improvement. Our fences are not yet up, but we are ready for them. I have been preparing the ground in the first place. As I said, our buildings are nearly completed.

We are just ready, really, to commence our legitimate work of illustration and experiment work. Every department of agriculture and horticulture is expected to receive a proper proportion of attention. You are interested of course to know what we are doing in horticulture. I have commenced this season for the first time the putting out of our fruit plantations. I have in our orchards and nurseries, this season, the entire collection of Russian varieties furnished by Prof. Budd, in all, 197 varieties. I have established a Russian orchard; of trees as yet, I have only seventy varieties. Prof. Budd could not furnish me trees of suitable age of more than about seventy varieties. I have two acres and a half devoted to these Russian apples. The trees are all two years old, and I have lost but two out of the entire number. I sent one of my young men down to Prof. Budd's nurseries in March,

and he selected under the direction of Prof. Budd, cions of everything that he had brought from Russia, and that he had received since his return. I have over 5,000 of these root-grafts now planted, and I find from an examination made yesterday that about seventy-five per cent. of them are going to live. The work should have been done much earlier in the season. I have over 3,000 of these root-grafts growing, and in the course of another year I shall be able to distribute from this nursery to our horticulturists throughout the State enough for testing purposes; I propose to furnish duplicates to your different experimental stations whenever they are ready to receive them. In addition to this line of work I have not only all the fruits, embracing his apples, pears, plums and cherries, but I have a large list also of ornamental shrubbery and trees that Prof. Budd found growing the most luxuriantly, or successfully, in the same climate as that of our northwest, where they have the same average temperature, the same degree of humidity, where there is every reason to suppose we should have the same degree of success; if they can grow these ornamental trees in Russia I don't know why we should not succeed equally as well in Minnesota.

In addition to this work I have planted an orchard of four acres of our most approved Minnesota apples for fruiting purposes. I have four varieties of pears that Prof. Budd found to be perfectly hardy in Russia which are hardy at Ames, Iowa, and which he recommends for Minnesota and Dakota. We will give them a test and another year we will be able to make a report on them. Of Russian plums I have only one variety; I had four specimens, but have only one of them living. Of the native plums of Minnesota we have a collection of the best varieties, etc. I have of the grapes, twenty-two varieties; they have all come through the winter in fine condition, and will be ready for fruiting next season.

In the line of small fruits, I have a large number of varieties of strawberries, raspberries, currants and gooseberries. They are all well established and making a good growth. In the line of vegetables I have growing this year about every thing that can be grown in the State of Minnesota, and in condition may be ranked as good, bad and indifferent. Some of these varieties of vegetables are doing remarkably well; some of them owing to defective seed, are looking very poorly. I can report one crop that is vigorous wherever it has had a chance, and that is weeds and grass. [Laughter]

Now, in our work in horticulture I wish to place the Experimental

Farm in full accord with this Society; I wish to receive the suggestions of its members as to any of the lines of experimentation that they wish to have employed and carried out.

Every member should have a deep interest in the success of this Experimental Station—it is yet in its infancy, and will need all the support and encouragement you can give it, but by such assistance we can make it worthy of our Society, our State, and its grand resources.

The Judges being ready to report, the following award of premiums was then read:

AWARD OF PREMIUMS.

STRAWBERRIES.

Best general collection of five named varieties, George S. Woolsey, Minneapolis, first premium, \$5; J. C. Kramer, La Crescent, second, \$3; best four varieties, Wm. Lyons, Minneapolis, first premium, \$3; G. S. Woolsey, second, \$2; best three plants in pots, H. F. Busse, Richfield, first premium, \$3; Wm. Lyons, second, \$1. Largest fruit of any variety, (Sharpless), Mary E. Hintgen, La Crosse, Wis., first premium, \$2.

Minnesota Seedling—(Early Princess,) J. C. Kramer, La Crescent, first premium, \$5; Wm. Lyons, second, \$3.

Wilson—H. F. Busse, first premium, \$2; Geo. S. Woolsey, second, \$1.

Crescent—Prof. L. Asire, Minneapolis, first premium, \$2; A. W. Sias, Rochester, second, \$1.

James Vick—J. C. Kramer, first premium, \$2; Geo. S. Woolsey, second, \$1.

Manchester—Wm. Lyons, first premium, \$2; Geo. S. Woolsey, second, \$1.

Glendale—G. S. Woolsey, first premium, \$2; Oliver Gibbs, Jr., Lake City, second, \$1.

Cumberland Triumph—A. W. Sias, first premium, \$2.

Minnetonka Chief—Wm. Lyons, first premium, \$2; G. S. Woolsey, second, \$1.

Sharpless—Mary E. Hintgen, La Crosse, Wis., first premium, \$2; H. H. Dyar, Minneapolis, second, \$1.

Bidwell—John Van Loon, La Crosse, Wis., first premium, \$2.

Boyden—John Van Loon, first premium, \$2.

CURRENTS.

Stewart's Seedling—J. F. Gilmore, Richfield, first premium, \$2.

FLOWERS.

Geraniums and Pansies—Best collection, C. A. Smith, Minneapolis, first premium, \$5.

Peonies—J. T. Grimes, Minneapolis, first premium, \$2.

Potted Plants—Mrs. M. J. Hillman, Minneapolis, first premium, \$2.

Boquet Wild Flowers—J. C. Kramer, La Crescent, first premium, \$2.

Boquet Roses—G. H. Roberts, Minneapolis, first premium, \$2; Mrs. M. A. Pearce, Minneapolis, second, \$1.

Collection Roses—Mrs. F. G. Gould, Excelsior, special premium of \$3.

Remarks. The collection of Geraniums and Pansies by C. A. Smith of Minneapolis, in the opinion of the judges, is one of the finest ever displayed before the Society.

The collection of Peonies exhibited by J. T. Grimes, of Minneapolis, were hard to beat.

The potted plants shown by Mrs. M. J. Hillman, of Minneapolis, were especially fine.

The boquet of wild flowers by J. C. Kramer, of La Crescent, was "a thing of beauty."

The boquet of roses by G. H. Roberts, of Minneapolis, is just splendid.

The collection of roses by Mrs. F. G. Gould, of Excelsior, will bear close inspection—a display well worthy of imitation.

VEGETABLES.

Best and Largest Collection—J. S. Gray, Minneapolis, first premium, \$5.

Asparagus—J. C. Kramer, La Crescent, Wis., first premium, \$1; Truman M. Smith, St. Paul, second, 50 cts.

Carrots—J. S. Gray, Minneapolis, first premium, \$1.

Onions—J. S. Gray, first premium, \$1; C. A. Smith, Minneapolis, second, 50 cents.

Radishes—C. A. Smith, first premium, \$1; J. S. Gray, second, 50 cents.

Turnips—C. A. Smith, first premium, \$1; J. S. Gray, second, 50 cents.

Pie Plant—Wm. Lyons, Minneapolis, first premium, \$1; F. X. Crepau, Minneapolis, second, 50 cents.

Cabbage—Fred Busch, Richfield, first premium, \$1.

Cauliflower—J. Ostergreen, St. Paul, first premium, \$1; Fred Busch, Richfield, second, 50 cents.

Peas—Wm. Lyons, Minneapolis, first premium, \$1; G. H. Roberts, Minneapolis, second, 50 cents.

Cucumbers—Fred Busch, Richfield, first premium, \$1.

Potatoes—Wm. Lyons, Minneapolis, first premium, \$1.

Lettuce—J. S. Gray, Minneapolis, first premium, \$1; N. H. Reves, Minneapolis, second, 50 cents.

The premiums awarded seemed to give general satisfaction and were at once paid by the Treasurer. The total amount of premiums as awarded by the several committees was: on fruits, \$56; on flowers, \$17; on vegetables, \$21; total, \$94.

On motion of Mr. Fuller the following resolutions were adopted:

WHEREAS, Our State is being continually invaded by tree agents, who have some new process for making trees and shrubbery perfectly hardy, and which they will warrant to any extent desired, and

Whereas, The last hobby is budded trees, which they sell at extravagant prices; therefore

Resolved, That we recommend, as we have before, that the people of the State give no order for trees to irresponsible parties.

Resolved, That Prof. Porter be requested to prepare a paper for publication in the papers of the Northwest in regard to the comparative value and hardiness of budded and grafted trees.

Mr. Harris, from the committee on Final Resolutions presented the following report, which on motion was adopted:

FINAL RESOLUTIONS.

Resolved. That the thanks of this Society are hereby tendered to Mr. H. A. Gale for the use of this hall for our meeting; to the citizens of Minneapolis for entertainment and encouragement; to the members in attendance at this meeting, and to the various railroads that have tendered to us reduced rates of transportation. Also to Prof. Budd, Secretary of the Iowa State Horticultural Society, and to Prof. Trelease, Secretary of the Wisconsin State Horticultural Society, and other members of those Societies for papers, words of encouragement and good wishes. Also to Commissioner Gibbs, Prof. Porter and others of the Faculty of the University, and Mr. and Mrs. F. G. Gould and Helen M. Gould and all others, who were in any way instrumental in constructing the late Horticultural exhibit of New Orleans and securing for our State such liberal awards and marked honors.

Messrs. F. Augustus Conkling and E. D. Jackson, appointed a committee to examine as to the merits and to select a name for the best seedling strawberry exhibited by J. C. Kramer, presented a report recommending the name "Early Princess."

It was decided to omit the visit to the parks and horticultural gardens in and near the city.

The fruits displayed were appropriated by the committee on arrangements for the purpose of providing for the picnic dinner.

The meeting on motion adjourned *sine die*.

The *Farm Stock and Home*, of Minneapolis, under date of July 1, 1885, says:

The Summer Meeting of the State Horticultural Society, which was held in this city, on Wednesday and Thursday of last week, was a grand success. The display of small fruits on exhibition plainly indicates the rapid progress made in this important branch of horticulture. The vegetables were marvelous, and the floral exhibition was good, considering the time of the year was advanced for roses. The different matters discussed by the members were interesting and profitable. The venerable president, of the Society, Truman M. Smith, of St. Paul, gave a glowing account of the progress made in the good work under the auspices of the Society. It is evident that the members never intend to give up the ship. As often as the fruit trees are killed by the severe frosts of winter, they will "pick the flint and try again." There are several seedling varieties of rare merit in our midst that withstood last winter's inclemencies, and these will take the place of the supposed iron-clads that proved too tender for this climate.

MEETINGS OF THE EXECUTIVE COMMITTEE.

A meeting of the Executive Committee was held at the office of *Farm, Stock and Home* at Minneapolis, June 19, 1885. There were present T. M. Smith, President, J. S. Harris, J. M. Underwood, Wyman Elliot, J. T. Grimes, Treasurer, and S. D. Hillman, Secretary.

A bill in favor of the *Pioneer-Press Co.*, of \$15, for printing was allowed.

President Smith proposed his resignation, assigning a reason for this action in a failure to secure proper recognition of the interests of the Society, from the State Agricultural Society.

On motion the committee declined to accept the resignation.

On motion of Mr. Elliot the time of holding the summer meeting of the Society was fixed on Wednesday and Thursday, June 24 and 25. After some informal discussion with reference to horticultural exhibits at the State fair, etc., the meeting adjourned.

A meeting of the Executive Committee was held at Market Hall, Minneapolis, June 25, 1885, all the members of the committee being present.

A bill of \$16, of H. L. Smith of Lake City, for printing, was allowed.

Oliver Gibbs, Jr., the former secretary of the Society, presented a statement of his account, showing a balance in his favor of \$43.33, including quarterly salary, which was accepted as correct and account allowed.

A bill of \$1.55, express charges, paid by Wyman Elliot, was allowed.

On motion of Mr. Harris each official member of the Society was authorized to distribute twenty-five copies of the annual reports of the Society.

The bill of Mr. Harris of \$8.85, expenses as delegate to the meeting of the Wisconsin Horticultural Society, was allowed.

An itemised bill of the Secretary of \$43.66, was allowed.

MEETINGS OF THE EXECUTIVE COMMITTEE.—Concluded.

A meeting of the Executive Committee was held at the State fair grounds, September 10, 1885.

There were present Messrs. Harris, Elliot, Day and Pearce, of the committee, Treasurer Grimes and Secretary Hillman.

Treasurer Grimes made a statement with reference to the ruling of the State Auditor as to the use to be made of the annual appropriation of funds in aid of the Society, to the effect that no money could be set apart as a reserve fund for the purpose of paying premiums, and that the same was only available to pay current expenses, etc.

On motion of Mr. Pearce, the Secretary was directed to communicate with the Attorney General as to his opinion upon the point raised. The meeting then adjourned.

A meeting of the Executive Committee was held January 22, 1886, at Harrison's Hall, Minneapolis, all the members being present except the Secretary.

The following bills were audited and allowed:

T. M. Smith, balance on account rendered \$3.50.

J. T. Grimes, incidental expenses, 1884, \$4.76.

S. D. Hillman, balance on account rendered \$35.55.

C. L. Smith, services as Assistant Secretary, \$15.

J. S. Harris, expenses and railroad fare, \$10.

A. W. Sias, expenses as Vice-President, \$4.80.

M. Cutler, expenses as Vice-President, \$3.85.

G. W. Fuller, expenses as Vice-President, \$3.10.

Rent of hall and janitor fees, \$23.

Drayage, use of plates and fuel, \$2.75.

MINNESOTA
STATE HORTICULTURAL SOCIETY.

NINETEENTH ANNUAL MEETING

—AT—

Harrison's Hall, Minneapolis,
TUESDAY, WEDNESDAY, THURSDAY AND FRIDAY,
JANUARY 19, 20, 21 AND 22, 1886.

Following is the circular sent out announcing the annual meeting of the Society:

The Program for the Annual Winter Meeting is unusually complete, and the officers of the Society feel assured of an interesting and profitable session. To this end they earnestly and cordially invite every member of the Society, as well as all others interested in horticultural pursuits, to be present and take part in the proceedings. It is hoped and expected that County horticultural societies and other kindred organizations from a distance, will send delegates and take part in the discussions. The amount of personal sacrifice made necessary by attendance upon the daily sessions will be amply repaid by the information which may be gained from the consideration of numerous practical topics to be brought before the meeting.

The public are earnestly invited to attend, especially the evening sessions, as the meetings are not exclusively for members, but are free to all. The ladies are very cordially invited.

Any person may become a member of the Society on payment of one dollar, the annual membership fee, and be entitled to receive one or more copies of the annual reports and back numbers if desired.

In addition to the usual reports of officers and the members of the various fruit committees, it is specially requested that members and others prepare short papers or essays upon practical and useful subjects, giving their experience and such suggestions as may seem timely and proper, and such as may be calculated to elicit profitable discussion and afford valuable information upon horticultural subjects.

tural topics. Useful hints may be given concerning the best and most profitable varieties for different localities, methods of care and culture; also experience as to varieties which have proven unprofitable, thus enabling others to avoid needless expense from planting inferior kinds, or those not suitable for certain localities. Reports are desired upon hardy varieties of fruit which have escaped injury the past severe winter, as well as the methods adopted to afford protection. Any one unable to attend is invited to send such notes to the Secretary. A number of papers and reports will be given in addition to the list published herewith.

Members in attendance at the meeting from a distance, will be provided by the Secretary, on application, with certificates which will enable them to return to their homes over the various lines of railway at one-fifth the regular rates, they having paid full fare coming to the meeting.

Members in attendance from a distance will be provided with entertainment by the local committee on arrangements. For further particulars address:

S. D. HILLMAN, Secretary,

MINNEAPOLIS, MINN.

TRUMAN M. SMITH, President,

ST. PAUL, MINN.

PROGRAM.

The following order will be adhered to as near as circumstances will permit, but may be varied from time to time as the Society may think best.

FIRST DAY.—TUESDAY, JANUARY 19, 10 A. M.

Opening Exercises. Arrangement of Exhibits and Reception of Members.

Appointment of Committees. On Award of Premiums; on Finance; on Final Resolutions; on Publication; on Obituary.

AFTERNOON SESSION.—AT 2 P. M.

Address of Welcome. Prof. Edward D. Porter, in charge of Theory and Practice of Agriculture, University of Minnesota, Minneapolis.

Response to Address of Welcome. Geo. W. Fuller, Litchfield.

Practical Suggestions for Horticulturists. Col. John H. Stevens, Minneapolis.

Discussion on same.

Reports from Local Societies. By Secretary Hennepin County Horticultural Society, J. E. Northrup, Minneapolis; Olmstead County Horticultural Society, M. J. Hoag, Rochester; Minnesota Valley Horticultural Society, A. B. Register, Granite Falls, and others.

Question Box

EVENING SESSION.—AT 7 P. M.

President's Annual Address. Truman M. Smith, St. Paul.

Grape Culture. Silas Wilson, President Iowa State Horticultural Society, Atlantic, Iowa.

Discussion on same.

Cross Breeding of Plants. Geo. P. Pepper, Pewaukee, Wis.

Discussion on same.

Pruning and the cause of Black Heart in Apple Trees. Dr. T. H. Hoskins, Newport, Vt

Discussion on same.

SECOND DAY.—WEDNESDAY, JANUARY 20, AT 9 A. M.

Report of Seedling Committee. John S. Harris, La Crescent.

Discussion on same.

Russian Apples. A. W. Sias, Rochester.

Reports on Russian Apples. A. G. Tuttle, Baraboo, Wis.; Andrew Peterson, Waconia; Chas. Ludluff Carver, and others.

Discussion on same.

Miscellaneous Business. Premium List Horticultural Products at State Fair; Discussion; Question Box, etc.

AFTERNOON SESSION.—AT 2 P. M.

Ad Interim, or District Reports, by Vice Presidents of the Society: A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; F. G. Gould, Excelsior; G. W. Fuller, Litchfield.
Discussion on same.

EVENING SESSION.—AT 7 P. M.

Music by Glee Club.
Some Fungous Diseases of Small Fruits. Prof. A. B. Seymour, Wisconsin State University, Madison, Wis.
Also, Suggestions upon Grape Rot, Pear Blight, Spot Disease on Strawberries, etc., Prof. Seymour.

Music by Glee Club.
Climate and Horticulture. Prof. D. R. Maginnis, Northfield.
Aesthetic Features of Horticulture. H. H. Young, St. Paul.
Music.

THIRD DAY.—THURSDAY, JANUARY 21, AT 9 A. M.

Annual Report of Secretary.
Annual Report of Treasurer.
Training and Pruning the Grape. Samuel Doughty, Lake City.
Grape Growing at Minnetonka. A. W. Latham, Excelsior.
Discussion on same.
Humbugs in Horticulture. M. Cutler, Sumter.
Success and Failure in fruit growing in the Northwest. F. G. Gould, Excelsior.
Correspondence, etc.
Question Box.

AFTERNOON SESSION.—AT 2 P. M.

Horticulture on the University Experimental Farm. Prof. E. D. Porter, Minneapolis.
Discussion on same.
Orchard Management. M. Pearce, Minneapolis.
Discussion on same.
Report of Finance Committee.
Report Committee on Districting the State. J. S. Harris, Chairman.
Annual Election of Officers, by ballot.
A complete Farmer's Garden. J. S. Harris, La Crescent.
Question Box.

EVENING SESSION.—AT 7 P. M.

Music by Glee Club.
Floriculture as Related to the Adornment of School-grounds. Mrs. C. O. Van Cleve, Minneapolis.
Fruit Culture in Southern Dakota. Mrs. Laura A. Alderman, Hurley, Dakota.
Entomological Report. Prof. N. H. Winchell, Minneapolis.
Some Notes on the Biological Aphidae, or Plant Lice. O. W. Oestlund, Assistant on Minnesota Geological and Natural History Survey, Minneapolis.
Discussion on Same.
Music.

FOURTH DAY.—FRIDAY, JANUARY 22, AT 9 A. M.

Reports from Experimental Stations:

PROF. E. D. PORTER, Minneapolis.	PETER M. GIDEON, Excelsior.
M. PEARCE, Minneapolis.	G. W. FULLER, Litchfield.
A. W. SIAS, Rochester.	R. M. PROBSTFIELD, Moorhead.
F. J. SCHREIBER, Moorhead.	ANDREW PETERSON, Waconia.
CHARLES LUDLUFF, Carver.	UNDERWOOD & EMERY, Lake City.
B. TAYLOR, Forestville.	FRED VON BAUMBACH, Alexandria.
E. H. S. DARTT, Owatonna.	L. E. DAY, Farmington.
J. H. BROWN, Lac Qui Parle.	J. S. HARRIS, La Crescent.

Report of General Fruit Committee:

SIDNEY CORP, Hammond.	D. K. MICHENOR, Etna.
CHAS. BRENDERMULE, Moorhead.	C. E. SHANNON, Granite Falls.
O. F. NORWOOD, Balaton.	M. C. BUNNELL, Newport.
J. N. STUBBS, Long Lake.	GEO. S. BARNES, Fargo.
WILLIAM McHENRY, St. Charles.	O. M. LORD, Minnesota City.
CLARENCE WEDGE, Albert Lea.	E. MEYER, St. Peter.
M. CUTLER, Sumter.	G. W. FULLER, Litchfield.
L. E. DAY, Farmington.	CHAS. LUDLUFF, Carver.
W. E. BRIMHALL, St. Paul.	

Discussion on same.

Fruit for Farmer's Families. O. M. Lord, Minnesota City.

Small Fruit for Profit. Geo. J. Kellogg, Janesville, Wis.

Discussion on same.

Report of Committee on award of Premiums.

AFTERNOON SESSION.—AT 2 P. M.

Ornamentation of Homes. J. M. Underwood, Lake City.

Landscape Gardening and Public Parks. H. W. S. Cleveland, Chicago, Ill.

Evergreens and Their Uses. A. W. Sias, Rochester.

Coniferous Trees of the Rocky Mountains, their value and adaptation to the treeless prairies of the Northwest. D. S. Grimes, Denver, Col.

Our Treeless Prairies. S. M. Emery, Lake City.

Notes on Forestry. M. Cutler, Sumter.

Miscellaneous Business.

Revision of Fruit List.

Place for Next Meeting.

Report Committee on Final Resolutions.

Question Box; the Bird Question, etc.

Announcement of Standing Committees.

Final Adjournment.

PREMIUM LIST.

WYMAN ELLIOT, SUPERINTENDENT OF EXHIBITS.

APPLES.

Best display of Wealthy Apples, first premium, \$5.00; second, \$3.00; third \$2.00.

For plates of Winter Apples in good condition, any variety, first premium, \$2.00; second premium, \$1.00. Five specimens to constitute a plate.

GRAPES.

Best plate of grapes in good keeping order, first premium, \$5.00; second, \$3.00; third, \$2.00.

PLANTS AND FLOWERS.

	1st Prem.	2nd Prem
Best display ornamental and flowering plants.....	\$5 00	\$3 00
Best floral design.....	7 00	5 00
Best pyramidal design boquet.....	5 00	3 00
Best display of roses in pots.....	2 0	1 00
Best display of geraniums	2 00	1 00
Best hand boquet.....	2 00	1 00
Best single plant in bloom.....	2 00	1 00
Best display begonias.....	2 00	1 00
Best display carnations	2 00	1 00

VEGETABLES.

	1st Prem.	2d Prem.
Best display.....	\$5 00	\$3 00
Best half peck early potatoes....	2 00	1 00
Best half peck potatoes for winter and spring.....	2 00	1 00
Best half peck onions.....	2 00	1 00
Best half peck turnips.....	2 00	1 00
Best half peck beets.....	1 00	50
Best half peck parsnips.....	1 00	50
Best half peck carrots.....	1 00	50
Best Hubbard squash.....	1 00	50
Best bunch celery	1 00	50
Best winter cabbage.....	1 00	50

SEEDS.

Best display Minnesota grown garden seeds, first premium \$5.00; second, \$3.00.

PANTRY STORES.

Best display canned fruits, \$3.00; second best, \$2.00.

Best display jellies, \$2.00; second best, \$1.00.

Best jar mixed pickles, \$1.00; second best, 50 cents.

Best sample home-made vinegar, \$1.00; second best, 50 cents.

Best sample comb-honey, \$1.00; second best, 50 cents.

Best sample strained honey, \$1.00; second best, 50 cents.

WORKS OF ART.

Collection of paintings, fruits and flowers, first premium, \$5.00; second, \$3.00.

Best single fruit painting, \$3.00; second, \$2 00.

Exhibitors are expected to make their entries the first day. All exhibits must be in place by 10 o'clock A. M the second day.

Competition shall be open to all, but it is expected that the annual membership fee will be contributed unless exhibitors are members of the Society.



ANNUAL WINTER MEETING
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY,

HELD AT HARRISON'S HALL, MINNEAPOLIS,

JANUARY 19, 20, 21 and 22, 1886.

The nineteenth annual winter meeting of the State Horticultural Society, held at Harrison's Hall, Minneapolis, was opened Tuesday, January 19, 1886. The meeting was called to order at 10:30 o'clock A. M., by the President, Truman M. Smith, of St. Paul.

Prayer was offered by G. W. Fuller, of Litchfield.

Secretary Hillman being called to Winona, as a witness in an important railroad case, his brother, Wm. O. Hillman, of St. Paul, served in his place during the first three days of the session.

Mr. Cyrus L. Smith, of Minneapolis, served as Assistant Secretary during the entire session.

President Smith. The first order of exercises is the arrangement of exhibits and the reception of members.

Col. Stevens. A committee for the reception of members has been selected for the purpose of providing entertainment of members and delegates. Perhaps it would be well to have it understood at the outset who the members of the committee are, so that visitors can go to them, and find where they will stay while in the city.

Mr. Pearce. We have a place for all that come, and at the proper time they may come to Mr. Elliot, Mr. Roberts, Mr. Grimes, Mr. Lyons and myself. As soon as we adjourn this forenoon, if visitors will come to the committee, we will designate a place for each of them.

President Smith. There is a committee to appoint on awarding premiums, on finance and others; I would announce as a Committee on Awarding Premiums, Messrs. M. J. Hoag, of Rochester, W. E. Brimhall, of St. Paul, and F. G. Gould, of Excelsior.

The Committee on Finances is already appointed, as by the constitution of the Society, the Executive Committee, with the exception of the President, Secretary and Treasurer, compose the finance committee.

As a committee on Final Resolutions, I will appoint Messrs. J. S. Harris, of La Crescent, Col. J. H. Stevens, of Minneapolis, and G. W. Fuller, of Litchfield.

The committee on Obituaries should now be appointed; has anyone any suggestions to make with reference to that committee?

Mr. Harris. I would suggest that Col. Stevens, and the Secretary, Mr. Hillman, and Mr. Sias be on that committee.

The Chair accordingly appointed Col. J. H. Stevens, A. W. Sias and S. D. Hillman as a Committee on Obituary.

Mr. Harris. Mr. President, I think it would facilitate business somewhat, to appoint committees on the different branches of fruit, to recommend varieties for cultivation and for trial; for instance, a committee on grapes, and a committee of three on Russian apples. Of course, these matters will be discussed by the Society, but we will hardly have time to revise our whole list in these discussions; and, for that reason, I propose the appointment of committees. There are questions that should come before committees, and not before the Society; for instance, taking the Russian varieties, they are but little known by the mass of the people, and there are members here who are familiar with them. I would move that a committee of three be appointed to select a list of Russian apples, of eight or less varieties for general cultivation, and also eight varieties, or less for trial, and let the report of that committee be the action of the Society.

President Smith. I should be opposed to recommending eight varieties of those apples. I think, as we have our Experimental Stations and University Farm, we had better let them have a longer trial, and be thoroughly tested before committing ourselves by recommending

particular varieties, so that the purchasers may not blame this Society. Where this Society has put forward varieties one year, which it has condemned the year following it has injured us. Eight varieties are more, perhaps, than we could conscientiously recommend.

The motion of Mr. Harris was adopted.

Mr. Pearce. I would move that this committee be appointed by the Society, and that as chairman of that committee, Mr. Tuttle, of Baraboo, Wis., be appointed.

Mr. Tuttle. I should object to serving on that committee. I am propagating Russian apples to some extent; I can tell what I know about them and I prefer to do it, rather than act as a member of the committee.

President Smith. What is the pleasure of the Society as to excusing Mr. Tuttle?

Mr. Smith. The object of that committee is to make a report as coming from this Society, and I agree with Mr. Tuttle entirely; he is a propagator of Russian apples, and is offering them for sale, and although I have no doubt of his honesty, I think that committee should be composed of men not engaged in the selling and propagation of those trees, if you want to get a report that will have any force whatever. Here is Mr. Grimes, Mr. Cutler, Mr. Whipple, Mr. Hoag of Rochester, and others that are not engaged in selling trees; they can consult with these men that are propagating them, and recommend on the strength of that. Here is Mr. Peterson who is not engaged in selling those trees, and who has had a good deal of experience with them.

Mr. Tuttle. I would be willing to state to the committee the experience I have had with Russian fruits. I think that it would be far better that a report should come from disinterested persons not prominently known as propagators of those Russian apples.

Mr. Pearce. I think that every member of this Society has entire confidence in the integrity of Mr. Tuttle; I am very certain that he is better posted on Russian fruits than anybody else. I withdraw my motion and nominate, as chairman of that committee, Mr. A. W. Sias, of Rochester.

Mr. Sias. I object to serving on the same ground that Mr. Tuttle has given. I am a propagator, on a small scale, of Russian apples, and that I think, is reason enough for declining to serve on that committee.

Mr. Harris. Mr. President, I have entire confidence in the honesty

of Mr. Tuttle and of Mr. Sias, but I would like to see men placed on these committees who are known to be disinterested, so that it will not look as if our Society was run in the interests of the nurserymen. For that reason I would object to Mr. Sias; but I would be very much in favor of Mr. Hoag. He lives close by Mr. Sias, has seen his trees and knows how they behave. Mr. Peterson would be a good man, or almost any other man that knows how the Russians behave. We want a competent committee, for in making a report, the committee will have to state that they recommend such and such varieties.

Mr. Sias. Mr. President, my neighbor, Mr. Hoag, although not a nurseryman, was brought up in a nursery, and is one of the best posted men in the State in horticulture.

Mr. Pearce. My object in nominating those men was to get a report from the men who were most likely to be the best informed. I like my information fresh from its source. I contend now if you do not put them on the committee, you have got to go to these men and take the results of their experience and your committee will have to get their report from them after all. But if objection is made to it, I will withdraw my motion and nominate Mr. Hoag.

The motion was adopted.

The Chair then announced that he would appoint M. J. Hoag, M. Cutler and A. Peterson, as a committee on Russian apples.

Mr. Pearce. Mr. President, I move that a committee on grapes be appointed who shall recommend a certain number of varieties for cultivation, and a certain number of varieties for trial.

The motion was adopted.

President Smith. In appointing this committee I will say that I feel the responsibility of it, and will appoint men that I think have had some experience. I will appoint J. S. Harris, J. T. Grimes and W. E. Brimhall.

Col. Stevens. Mr. President, I would like to see the western part of Minnesota represented, and I move that Mr. Regester, of Granite Falls, be added to the committee.

Mr. Regester. Mr. President, I would object to serving; I am expecting the president of our home Society here to-day. His name is O. E. Saunders. I would decline in his favor.

Col. Stevens accepted the amendment, and the motion making Mr. Saunders a fourth member of the committee on grapes was adopted.

Col Stevens. As this makes an even number on that committee, I would suggest that another member be added, a man that knows all

about grape culture, and that is our president. I think that he ought to be added to that committee. There is no question but what he has had as much experience as any or all of us put together. I move that our president be added to that committee.

The motion was adopted.

On motion, the meeting then adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TUESDAY, JANUARY 19, 1886.

The meeting was called to order by the President at 2 o'clock P. M.

ADDRESS OF WELCOME.

Prof. Edward D. Porter, of the State University Farm was introduced and delivered the following Address of Welcome:

Mr. President, and Gentlemen of the Horticultural Society:

I feel myself, sir, very highly honored in being called upon to extend to you the congratulations of the horticulturists of Hennepin County and the citizens of Minneapolis upon this your nineteenth annual meeting. We greet you, sir, not as strangers in our midst, for your annual gatherings for years past have been looked forward to by our citizens with pleasure and with profit. We greet you also, gentlemen, not only for the many pleasant social relations which have been formed by these gatherings, but for the honor of the work in which you are engaged. By your efforts you have removed the stigma which rested in the early years of our State history upon us, because our soil, they said, was unfruitful and our climate uncongenial, incapable of producing anything but snow and ice, and pine trees and prairies. But your efforts have shown, that, in addition to these, and fair women and noble men, and an abundance of No. 1 hard wheat, we can compete with the world in the production of flowers and fruits and vegetables, these three graces of agriculture which add beauty and comfort to the strength of the other products of the soil. But, gentlemen, these results have not been accomplished without untiring labor and ceaseless energy. The difficulties, discouragements and failures in horticulture in this State in the past thirty years have been enough to dishearten men of average courage, but, as "a smooth sea never made a skillful

mariner," these failures have only stimulated you to greater effort and these difficulties met and mastered, have not only accomplished grand results in our State, but have placed you, gentlemen, in the front rank among the horticulturists of this or any other land. We honor them for the work that they have accomplished, and hoping, that your stay in our midst may be as pleasant to you as we know it will be agreeable to us, and believing that your labors and deliberations will be of lasting benefit to our State, we bid you, sir, a most cordial welcome.

RESPONSE TO THE ADDRESS OF WELCOME.

Mr. Geo. W. Fuller, of Litchfield, responded on behalf of the Society. He said:

Mr. President:

We have too often enjoyed the hospitalities of this city not to know that these are not the words of a mere formal address, but are the expressions of the real feelings of the citizens of Minneapolis.

You are building here a great city. And you are wise in planning to make it great, not only in the census of its inhabitants; in the number and magnitude of its buildings and in its manufacturing and business establishments; but great also in the æsthetic, mental, moral and religious power of its citizens.

Hence, your schools, your churches, your societies for encouraging music and the fine arts, your beautiful homes, surrounded by lawns and flowers; your shade trees and grand system of public parks.

God has put into every soul an element of love for the beautiful. And all these things have an educating as well as restraining power.

Keep a flowering plant in every house, a pure painting on every wall, a grass plot and shrubs about every home, and your streets shady and clean, and the people, even the lowest, will measurably approximate in character to their surroundings.

And He has given us flowers and plants and fruits innumerable to meet and satisfy the demands of our nature. And He has made even the fruits and vegetables to contribute to the beautiful before they do to our grosser needs, the blossoms and the changing tints coming before the perfected fruit.

And it is our work to do what we may, to extend the cultivation and influence of these God-given fruits and flowers.

We are confident that an increased interest in these things is ex-

tending through our State, not only in the cities and villages but in the country as well, and that soon beautiful as well as comfortable homes will be the rule in country and town. And we are glad that in this city so strong an interest is manifest in this direction.

I believe, Prof. Porter, you are building what is to be one of the most beautiful cities on earth.

We thank you for inviting us now to enjoy its hospitalities.

Col. J. H. Stevens, of Minneapolis, next read a paper entitled "Practical Suggestions for Horticulturists," which was received with applause, and on motion, a copy was requested for publication in the annual report. Following is the paper referred to :

PRACTICAL SUGGESTIONS FOR HORTICULTURISTS.

By J. H. STEVENS, MINNEAPOLIS.

Mr. President, Ladies and Gentlemen of the Minnesota Horticultural Society:

In responding to the demand made upon me to prepare a paper on the subject of Practical Horticulture in Minnesota, permit me to say that my time has been so constantly occupied with editorial and other labor, that I have not been able to prepare an address which the importance of the subject demands. I am not prepared to admit that we will not in the early future have enough fruit for our own use, and a surplus to export.

While it is true we cannot make as favorable a showing as we wish we could, we must not blame our climate and soil for all of our failures, because frequently our trees die of neglect or are eaten up by insects. We should not be surprised at this, for we are assured that in some of the best apple growing communities on this continent, that at least one-half of the newly transplanted trees are starved to death, one-fourth more are destroyed by borers, cattle, bad trimming and other enemies. So that the full proportion of those set, which never bear an apple is fully three fourths.

While our citizens are intensely practical as a class, we are sadly deficient in correct experiments, equality of circumstances which might influence the result and perfect accuracy in every particular are absolutely necessary in order to derive benefit from these experiments, and even after having done all in the most accurate manner, it would not seem to be safe to form positive conclusions from the results of one, two or three trials, for there may be circumstances unknown to us, or beyond our control, which might give a result from which we should, if we depended on it, form wrong conclusions; or spreading abroad, we might probably mislead others. It is safe to believe that many an inquirer after horticultural truth may be discouraged by the apparent conflicting of the results of experiments, and it may be, is led to think that it makes no great difference after all, which way a given thing is done. Any way our experiments already made in Minnesota, in growing fruits has developed three facts, viz:

First. That there are a few—a very few varieties—standard apples that are iron

clad up to this time, the origin of which is generally believed to be of a Siberian parentage; that we have great expectations from seedlings such as Peter M. Gideon, and others have propagated, and are in great hopes that the Russian varieties so extensively introduced may prove hardy. The iron clads already mentioned, with the numerous Russians, together with the hybrids—say the Whitney, the Beeches Sweet, and near fifty other semi-crab sorts, will, it is believed by our most practical fruit growers in an early year—furnish us an abundant supply of apples. The native wild, and the descendents from them, gives us a good supply of plums, just about as good as any of the tame varieties that are raised in the east.

Second. There is not a state in the Union that excels us in the production of small fruits; currants, gooseberries, strawberries and raspberries are all at home in our soil. It is to be greatly regretted that the blackberry could not be added to the list, in order that it should be complete, but it is almost proven to a certainty by many of our best fruit growers, that such varieties as the Ancient Briton, Stone's Hardy and the Snyder, may yet with proper care be grown with success.

Third. Grapes of many varieties are certain, and an exceedingly profitable crop. We bid fair to rival the vine clad regions of the old country in their product. They are within the reach of all, no farmer or gardener nor householder can afford the absence of the luxury from their premises.

With these considerations it is difficult to arrive at any other conclusion than the practicability of growing fruit in this State. If it could be proved, that no man had ever made money for his labor through fruit growing in Minnesota, as an occupation, and that all following it had been always obliged to restrict themselves to the greatest economy, in order to gain a livelihood, that it never in any instance paid a fair profit on the capital invested, then indeed, we might be somewhat disheartened, and might consider our case rather a hopeless one. But a very different state of things can be proven. It is well known that our fruit growers in the vicinity of St Paul and Minneapolis, have made money, especially this is so with our small fruit and grape growers. I speak of those, because I am acquainted with them, if those engaged in this industry in the neighborhoods mentioned here made it pay—others throughout the State can, in like manner make it pay. It is a true saying that "whatever man has done, man may do."

I do not deny but what to produce fruit of the larger varieties requires patience and practice and work in this climate. The powers of earth, air, frost and water have joined those of the far distant sun, and during the hitherto rather short life of most of our apple trees, there has been an example of a complication of the most wonderful laws of nature. It seems to have been ordained that every step in the knowledge of apple growing must be won by trial and exertion, and thus it has been during the past year; we are only able to slowly unfold the wonders that occurred by the severe test of the winter of 1885; wonders we might add that are occurring on every side during the every day experience of horticultural life. The field, too, widens as we advance, until we find that every step has its consequence; every breath of air its appointed mission; every drop of due its office to perform; we discover that we are in the midst of causes and results, of which our knowledge is limited; that the threads we have seized only guide us to new and more difficult labyrinths of investigation. What we know dwindles away, when we compare it with the sum of that which we desire to know. We realize we have

to contend with climatic influences, but "let us work on and win." We are morally certain of being victorious in the end. None need be discouraged so long as we are favored with so many encouraging results which have been handed down from the recent past. These show not only what fruit growing may be, but what it is. It will doubtless be said that this is rather a slow way of reporting progress. Be it so, it is a sure way. The injury to apple trees by the strange fatality of last winter's phenomenon, was not confined to Minnesota. It reached south to Missouri and east beyond the big lakes. When we consider the injury inflicted on the trees in these celebrated apple producing states, remote from our boundaries, we have abundant reason to be thankful that we had even five or six varieties of the standard apple, that survived the frosty element, even to the terminal bud of the branches of the trees. This is encouraging. It shows that we have the *pyrus malus* that are iron clad. They should be in the hands of all of our farmers. If we have one, two, three, four, five and six varieties, now, we may reasonably expect the introduction of more of the same sort every year. This is a law of nature. Let no one forget it. Our worthy old pomologist, Peter M. Gideon, has some forty varieties of new seedlings which he has propagated on the shores of Lake Minnetonka, which are quite equal to the Wealthy. Some are hardier than that famous apple. Some too, are of more merit, and are longer keepers. All of these will soon be scattered all over the four corners of the State. Several other gentlemen in this State have, too, new seedlings that defied last winter's frosts. No one denies but we have many things to learn yet in regard to pomology. Probably if it were made a rule in moving trees to reduce the last year's growth to one bud, half the failure in transplanting would not occur, provided the proper care had been bestowed on the new set out trees, because the head and roots would be brought at once to something like a balance of power. Shortening-in and mulching trees ought to be followed as established practical rules in this climate in transplanting, every deciduous tree requiring more care than a willow. We all know that the best growth and the finest fruit, are always to be expected when the tree is furnished with the materials of nutriment in just the right proportion. If greatly deficient in any essential ingredient, the tree languishes from starvation. If any highly nutritive substance is in a large overdose the tree may be surfeited or poisoned.

We must bear in mind that in large portions of Minnesota the soil is very fertile and rich. During the months of June, July, August and September, we have the average temperature of southern Ohio. The overfeeding of one year's growth is worse than lost. Several years will be required to establish a healthy action again, especially if the tree stands in a rich soil so as to dissolve a great amount of food. There is certainly a great contrast in the temperature in our State between summer and winter; certain laws of pomology must be observed. These laws have heretofore and will be hereafter pretty thoroughly analyzed by the Minnesota State Horticultural Society. They will be made so plain that all can understand and master them.

It is well demonstrated that the few varieties of apples we do produce are far superior in quality to those same varieties in other States. This is another curious law of nature, with the law on our side. It is an ill wind that does not blow some one good. Again, apples, the product of Minnesota, are finished off in the most

artistic manner. Dame Nature's master hand paints and polishes them in the most satisfactory and beautiful manner, our most celebrated artists cannot do them justice with their talented pencils. Usually the plates of the tree peddlers are far ahead of the appearance of the original fruit, but the autumnal tint bestowed on the bright, glossy, delicate hue of the Minnesota fruit defies the handiwork of the most famed painter's brush, hence, when on exhibition competing for premiums, we always come out ahead. Witness our success over all competitors at the American Pomological Society in the autumn of 1883, at Philadelphia, and again at the world's exposition in New Orleans, last winter.

Many failures occur in Minnesota for a want of seasonable attention. These failures should not be charged to the impracticability of growing fruit, neither should our northwest nurserymen be blamed for so many failures. If properly sifted a good deal of the trouble comes pretty near our own doors. Now, when all the causes are properly analyzed it may be, we are not justified in attributing to the climate and soil so large a share of our disasters. It is better to divide the responsibility so that the frosts of winter and the heat of summer, the manner in which we cultivate our trees, our soil and climate, can all come in with a co-equal assumption of our misfortune. There is no doubt of one great cause of the failure of fruit in Minnesota. It is patent to everyone except the victims. It is the accursed foreign tree peddler, they will humbug most every farmer to give copious orders for trees that are perfectly worthless, at the same time many of these victims would utterly refuse to consider an order from our own nurserymen where they could get honest stock true to name. It stands our nurserymen in hand to be honest, if otherwise they would kill the goose that lays the golden egg. It is by no means any proof that this is not a fruit producing State, because of the failures from the trees purchased of these dishonest outsiders.

The site of orchards have a good deal to do with the practicability of growing fruit in Minnesota. Selections can be made on a quarter section of land, that would be called favorable locations. At the same time the site of an orchard could be selected on the same quarter section that would prove to be unfavorable.

Finally, Mr. President, if we come down to pretty near the facts in the case, we shall find that in proportion to the numbers engaged, that there will not be a great difference in the failure of those engaged in horticultural pursuits, and those that are engaged in a strictly legitimate agricultural industry. The books will be pretty nearly balanced.

DISCUSSION.

Prof. Porter. I wish to bear my testimony to one statement that Col. Stevens has made, that the cause of failure in fruit growing in Minnesota, as well as in other portions of the old states, is largely due to the neglect and carelessness of the grower, and not to the climate nor to the stock that is grown. I will venture to say that throughout Minnesota, the proportion will be larger than Col. Stevens has mentioned of trees that have received no attention whatever. They have been received from the nursery, set out in unprepared

soil, "wished" well, and that is the end of it. All the varied conditions of climate and the required treatment are forgotten. These methods fail to give the very best results, and fruit-growing is condemned. It is very rarely the case that in traveling over our State and examining apple orchards or small fruit, that I have found an orchard or garden that is half tended, that is not overgrown to weeds and grass, the common pasture field for all kinds of stock, no protection, either in winter or summer, and no pruning. One thing that has struck me very forcibly, especially in this whole Northwest, is this neglect of pruning trees. There seems to be a sentiment among our farmers that you must not touch a tree after it is once put in the ground. I think we should share a portion of the responsibility with Dame Nature.

Mr. Pearce. Another thing occurs to me. I think a great drawback to our fruit-growers is that they labor under a wrong idea as to the best locality to plant their trees.

Since 1854 farmers, universally, have been looking for an old piece of land, well protected by timber as an orchard site, the warmest place they had on their farms. To-day, if you travel over the country, you will find orchards on just such localities. The reverse of that I believe to be the correct plan of growing orchards. If you have a piece of land, high, smooth, unprotected, there is where you should put your trees. Where the Wealthy, is on the highest pinacles of Minnesota, it is in the best condition.

Mr. Smith. Mr. President, I set out an orchard fifteen years ago, and tried to get the trees in the most sheltered situation we could find. Those trees that were in the most exposed localities were the ones that stood the winter's blast, and the trying ordeal of last winter.

I made a few notes in regard to what the Colonel said. He says "Fruit growers have been making money." I want to speak of one case that was reported to our local society of a man near here that set out an acre of strawberries. It was the first experience that the man had ever had. He planted just about an acre of strawberries, first in the season of 1884. In 1885 he sold from that one acre \$400 worth of berries, at a net profit of \$300. Again the Colonel said he thought one man could do what another had done under the like circumstances. Now, there is Mr. Nobles; he has been successful in grape growing in McLeod County. I was at his place just as his Concordes were ripening, and his vines were loaded with great, beautiful clusters of fruit. It is

worth remembering that he is a successful fruit grower out in McLeod County.

As to raspberries and blackberries, I am thoroughly convinced that covering with good clean soil is the only certain protection for them, and I know that that can be successfully and profitably done; that we can afford to cover the same as grape vines, and make a certainty of every crop. I am glad to say that that has been practised. Another thing: In setting out apple trees there should be very deep stirring of the soil before the trees are set. If it is where you can plow, run three or four furrows, and back-furrow on that, until you get two or three feet of loose soil; then set the tree. If you set the tree without plowing, dig a hole three or four feet across, stirring the ground thoroughly, then mulch. We have to fight drought in this country, and it is in this way that our trees can be made to stand our winter's cold and the summer's drought. I would ask Mr. Chandler to state how he covers his blackberries?

Mr. Chandler. I turn them over, and cover them with fine, loose dirt, not more than three or four inches in depth.

Prof. Porter. I will give the method I have been practicing for the last thirty years for covering blackberries, which I find very effectual, and it is applicable to grapes, raspberries and blackberries. In the first place, I want the ground clean. I get that by careful tillage in the proper season of the year; but I don't want any cultivation in my orchard, except the merest surface cultivation. I want it done early in the season, and then check the late growth by pinching back. I have just enough surface cultivation after that to stimulate the late fall's growth, and the first frost kills the leaf. Then I endeavor to bind my vines all in one direction. The direction, of course your rows will determine. I make a small mound of earth against the vine, making a shoulder, as it were, over which the vines are bent, so as to prevent the breaking of the canes, and then I cover with the soil. It is not a very great depth of covering that is desired; two or three inches is as good as two or three feet. It is simply to protect the canes, not from the frost altogether, but from the sun and wind. I have been engaged in fruit growing about thirty-five years, and have found that it paid in Pennsylvania and Delaware to cover my vines, as it pays in Minnesota. While it was not necessary to cover, with many varieties, to prevent winter-killing, the increased productiveness, the certainty of a finer crop more than compensated for the labor performed. Of course, there are some varieties that cannot be grown,

even in the mildest climates, without this protection; but all varieties of grape vines, amply repay for this protection.

Mr. Harris. I would like to inquire if raspberries are treated in the same way as blackberries?

Prof. Porter. In the same way; I loosen the soil around the root so that it will bend without breaking. I will say that in preparing the plant for going into winter quarters by checking the growth, I do that by simply pinching; I don't want any knife, but by the thumb and finger pinch back the vine, throwing all the strength into the cane. In growing blackberries, I allow my canes to grow until about three feet in height. If let alone, a blackberry bush will make a rank growth, and has been known to grow seventeen feet of cane in one season. Of course, in that case you would have to cut about twelve feet off. By this process of pinching back you throw the strength of the vines into the fruiting buds, with this protection you can grow them without difficulty.

A Member. How do you cultivate your raspberries in the summer?

Prof. Porter. Well, sir, in the first place I want them planted in rows, for the purpose of economy of cultivation. I prefer growing in rows so that they can be cultivated, leaving plenty of room between the rows for thorough cultivation. I commence by plowing from the rows. I approach the hills until the plow strikes the rootlets of the plants, and am not afraid of injuring them. I find it stimulates the growth of the fruit more than enough to compensate for any damage done. After throwing the furrows from the vine, leaving a center unbroken, I then put the cultivators in and keep the ground thoroughly tilled and cultivated for a week or ten days, working it back towards the vines. After that there is nothing but the merest surface cultivation. I was led to this method of cultivation about twenty-four years ago. It was just after the commencement of the war, in 1862. I was in the grounds of a large grower of small fruits in southern New Jersey. He had a lot of raspberries and blackberries. He was a Northern man and a Quaker, and had an immense stock there, which he couldn't sell, and of course it was a great loss. He had a great success in the cultivation of the blackberry. In July, when I went through with him, in many places the fire weeds, jimson weeds, and grass was all over his patch of seventy-five acres, and you would have to hunt to find his blackberries. I laughed at him and asked him if he called that a model garden. The old gentleman stands about six feet, six, is well proportioned, very moderate and very slow in his speech, but direct

and simple. "Well now," he says, "friend Porter, I know that at first glance, it looks as if it was very slovenly; but after thee has been as long at gardening as I have, thee will not allow a hoe or cultivator among thy vines after the blossoms have set." And then he went on to explain. "Now," said he, "I used to till late in the summer, but I found in the first place, that I was stimulating an undue growth in my vines, and in the second place, I was running the chance of losing the crop by winter-freezing and thawing. I stopped that, and I have had no trouble with winter-killing." I took the hint and have adopted his methods, with some modifications. I don't want to conceal my vines; I like to see them. I like to cut the weeds out, and I can accomplish that with the merest surface culture, just cutting the weeds, and at the same time not stirring the soil enough to stimulate the late fall's growth.

Mr. Harris. When I came here this afternoon I had no idea of having anything to say to-day, but I am very much pleased with this discussion in reference to blackberries. I think it is important to prevent the breaking of the canes in laying them down, to dig away from the roots with a fork, from the side you bend them, and then bend the bush where it joins to the root, putting the fork down about six inches and bending the root. Then there is no danger of breaking.

Prof. Porter. That is necessary with very strong, heavy canes. Of course, you have to use a little common sense.

Mr. Harris. It has been said here that the most exposed situations are the best for orchards. Mr. President, I hope that no one will understand this Horticultural Society as advocating the seeking of the most barren peaks and exposed situations of Minnesota, for the planting of apple trees. I believe in high locations for apple trees, but not the most exposed. The best locations are high, but protected from the south and west winds. I believe we can raise apples on the prairies here, but we will not succeed until there are groves and wind-breaks all over between here and Dakota.

And then, I want to criticise those holes "three feet deep" for setting out apple trees. I don't dig any deeper than the ground has been pulverized with the plow. I like the idea of plowing; and if you dig a hole three or four feet square and half as deep, put in the loose dirt and set your trees, I will guarantee they will grow.

Mr. Pearce. In regard to covering small fruit, there is nothing that can be covered more easily than blackberries. If I was going to grow berries for profit, in preference to any I would take the blackberries.

The Philadelphia and the Turner raspberry don't need any covering to keep them. I don't think there is a place in Minnesota but what they will do well. The Cuthbert raspberry is one of the most valuable we have; it brings the highest price in the market, has a firm berry and you can ship it a thousand miles. But probably every third winter they would kill. They are of so much real value that it is worth a man's attention to cover them. My method of covering is very simple. It takes three men to cover to advantage. My canes are in rows, about twenty inches apart. I first provide myself with a pair of buckskin gloves to take hold of the canes. One man goes ahead with a fork and loosens the ground about the roots. Then I take hold of the cane and pull it down from the roots; I don't bend the stalk, I bend the root. One man puts about two shovels of dirt where the ends of the canes come together. I can cover an acre or more in a day. In my experience I find there is no occasion of covering the plants entirely; all you want is to keep them flat on the ground. I have tried it repeatedly. With blackberries I use a fork to loosen the earth around the roots. I take hold of the cane and bend it from the root; bend it right over, and when I get it laid flat a man stands by and puts a shovel of dirt on, which holds it. Three men will cover an acre of blackberries in that way in a day. I think the fork is the best thing that can be used. My experience is that if I get the plants to the ground and keep them flat there, they need no more covering. I covered all my Cuthberts this year in that way, and my blackberries.

A Member. Do you cover in hills or rows?

Mr. Pearce. The hills are in rows about three feet apart.

A Member. How many canes in a hill?

Mr. Pearce. Two or three. Then in the spring I take a fork, throw the dirt off, and raise them up.

A Member. I wish to ask if they have fruited well when not covered?

Mr. Pearce. I had some last year which I did not cover; they came out alive but with no fruitage.

Col. Stevens. We have a gentleman here who has been engaged in cultivating blackberries for thirty years. The variety that he has raised has been confined exclusively, or nearly so, to the Lawton. I have reference to Mr. John A. Ford, of Newport. I have known him for forty years. He came to Minnesota in 1841. He is present to-day. I would like to have him state to the meeting the manner that he cultivates the Lawton berry. I understand that he has never made

a failure during the whole time that he has had them, for twenty odd years.

Mr. Ford. I first commenced setting out the wild ones. I began the practice of covering them up, and I found they fruited much better. In the first place I got a thousand plants of a common variety which I tried for several years; they grew up immense canes, and when covered they would come out all right, but I found that they did not pay very well. I got a few Lawton's by accident, which a man had thrown away. I have been cultivating them, about twenty years. They have to be covered, but are very prolific, more so than anything I have ever seen. I have about an acre and a half. I also have the Snyder. They are a very good berry, they need cultivating; are not so large as the Lawton; they grow most too strong. The Lawton grows up four or five feet high, is more slender, and is easily laid down; I like it for that reason, and because it is the greatest bearer I have ever seen anywhere.

Col. Stevens. As long as I have lived in Minnesota, I never knew before that the Lawton blackberry could be ripened and grown to perfection in this State. Although I have seen Mr. Ford frequently, I never knew until to-day that he had met with such extraordinary success in their cultivation. I certainly feel as if we were gaining a great deal by his experience, and I would like to have him state how and with what he covers them, and what do you use for mulching?

Mr. Ford. I used to use straw; for the last two years I have used sorghum bagasse. In laying down I have a pair of buckskin mittens, and I take hold of the stalk, bend them down and throw dirt over them. I find the Lawton is the easiest to lay down. I just cover them lightly. If they are covered half an inch deep they are all right. If there is one sticks out an inch, it is killed to the ground.

Mr. Tuttle. Blackberries are very extensively grown in the neighborhood of Ripon, Wis. There are about sixty acres in cultivation there. Mr. Hamilton is the principal grower, and has been growing them, he tells me, for twelve years, and has never had a failure. His manner of covering is the same as that spoken of by Mr. Pearce. With a fork he digs the dirt from one side of the plant, puts his foot at the base, and pushes the roots over. The root will bend very easily, especially if laid down the first year; if you don't bend it over the first year you will have a good deal more work to bend and cover the second or third year. A portion of mine have never been laid down until this year. Mr. Hamilton tells me that two men will put down

an acre in a day. Blackberries are grown without much difficulty in Wisconsin; I never thought it was really necessary to cover them. I have been growing them some years, and one or two winters I have lost the crop by the vines winter-killing. I lost a crop last winter. The winter before they came through all right, without any protection whatever. There is no more work attending the covering of an acre of blackberries than there is an acre of strawberries, and a crop of blackberries is much more profitable.

A Member. How much fruit do you get on an acre?

Mr. Tuttle. I have grown ten thousand quarts on an acre. I have one acre of blackberries that I am very careful of. I am going to report what they produce in the future, and I believe that I shall report ten thousand quarts.

A Member. What is the kind?

Mr. Tuttle. The Ancient Briton. It is a larger berry than Stone's Hardy, more nearly the size of the Lawton, and is a great deal better in quality. Last year Mr. Hamilton's were a failure. He told me he had Stone's Hardy principally which he got on account of its extreme hardiness. In my experience it is not as hardy as the Ancient Briton, and he told me this fall at my place that he never would send out under his name any more fruit of the Stone's Hardy; that he had a reputation for what was called the "Ripon berries," and he didn't care to send out anything but the Ancient Briton; he said he had ordered the men to dig up all the Stone's Hardy and put them on the brush-pile.

Col. Stevens. I would like to ask Mr. Tuttle what he gets a quart.

Mr. Tuttle. The lowest Mr. Hamilton ever gets is ten cents; sometimes he gets eighteen cents a quart.

Col. Stevens. If you get ten cents a quart, and grow 10,000 quarts to an acre, that amounts to \$1,000 per acre.

Mr. Tuttle. That is what I am trying to do; I believe it can be done.

Mr. Barrett. You gentlemen talk as though blackberries were a success. They are a perfect failure with us, in every attempt that we have made in our locality. I procured some vines from Wisconsin, of the Ancient Briton, took proper care to cover them in the fall; the next spring they were very feeble, and during the succeeding summer they died. If any gentleman of experience can tell us how we can raise blackberries, he will tell us something of importance.

Mr. Fuller. I have never succeeded in growing blackberries on the

prairies beyond the big woods, but perhaps one reason is we have never tried the variety spoken of here. I intended to get a few vines of the Ancient Briton last year, but have not done so; I propose to try it another year. The Turner raspberry is the only kind that I grow; that does very well, and I get good crops.

Mr. Smith. I would like to ask Mr. Fuller if black raspberries don't grow there?

Mr. Fuller. No, sir, I think not without protection. The vines will winter-kill. We get a very good crop of black raspberries by cutting them off to the ground in the spring, and get very nice berries from the new growth. We have not practiced covering.

Mr. Cutler. I have had a little experience in trying to raise blackberries. Two years ago from the Ancient Briton I picked a little over 200 quarts, but since then have had but few berries. I have the Snyders; they are very prolific, and the Stone's Hardy; last winter they killed to the snow line. There were a few left below the snow line that blossomed, but produced no berries. I have come to the conclusion that the only way we can grow raspberries successfully, except the Turner, is by covering. Last fall I covered my Stone's Hardy, according to Mr. Pearce's method. I think we can raise blackberries, provided we cover and preserve them during the winter in that way.

Mr. Saunders. I would like to inquire if anyone has had trouble with the blight? In our vicinity, Chippewa and Yellow Medicine Counties, we are troubled considerably with that. The fruit blossoms well and sets, but when it has attained the size of a small pea, it blights, so that I have lost my crop for one or two years. I have the Doolittle, and some other varieties that I have cultivated with success, have this year done poorly.

Mr. Pearce. One word further on the raspberry in regard to this matter of winter-killing. The Gregg raspberry will kill, I believe, every winter in Minnesota; at the same time, it is the largest and best we have. I am growing them; a year ago I was very successful. I bank them up in the fall, from a foot to fifteen inches, in the spring I cut them back to sound wood, I then take the dirt and spread that around the vines. We grew last year in that way more and larger fruit than we had from leaving the whole top of the vines. I cut them right back to sound wood. Experts came and examined them, and all agreed that it was the best method of treating them.

In regard to this blight spoken of, that is the result of the vines having too little vitality. If your vines are heavy and vigorous, I

don't think that will trouble them. I have observed, that when the vines are cut back in the way I have spoken of, they do not blight, and this method of covering I think will be a grand success.

Mr. Harris. Mr. President, I have been troubled with the blight and once I found it was occasioned by chintz bugs working on the berry. I don't cover raspberries, that is the blackcaps. I have found that the Doolittle and the Seneca will form their berries and promise a good crop, and then, with the hot weather in June, about in strawberry time, the berries will all dry up. The chintz bugs may cause the blight, and do with us some times, but it is oftener caused by the canes being somewhat injured in the winter.

Mr. Kellogg. Mr. President, I don't want to prolong the discussion, but I would like to call attention to the necessity of taking the plants up early in the spring before the buds form. If you leave them down until after the buds form, (and we believe in covering the whole cane), they are more tender; but if you take them up just before a cold night you may lose your crop. I lost a portion of mine last spring. Then after they are up, give them a thorough mulching to prevent drought in the summer.

Mr. Whipple. Mr. President, I have had a little experience with small fruit. I always have taken pride in the success we have had. Now, it is said that the Gregg and Cuthbert are the latest bearers we have; but for several years, since I have been growing them I have found they were out of the market before the old variety that we have had ever since I have been growing fruit, (and that is twenty years), was still on the briers. That the covering of the Greggs warrants the success that has been told, I fail to see. I know one of the most experienced men with the black raspberry—I think one of the most experienced in the State—last season left his customers, and I had to carry them along for over a week when he could not supply them with his Greggs and Cuthberts; and he has made up his mind that he is going back to my old raspberries, the old Philadelphia. I will venture to say that I can grow that longer, every season, with the same cultivation than you can the Gregg or Cuthbert. I can give you dates of our last sales, and the names of customers to show that it is still fruiting when other kinds are gone.

Mr. Cutler. I would like to ask if there is any member here that is residing in this part of the country that has had good success with the Ancient Briton blackberry.

Mr. Harris. The only gentleman that I know of that has been

growing the Ancient Briton for any length of time is O. M. Lord, of Minnesota City. He has had good success. I have seen his Ancient Britons and Snyders growing side by side. They are certainly a finer berry than the Snyder, and he gets more fruit from them.

Mr. Pearce. I would say that Mr. Shepard has grown the Ancient Briton for the last five or six years in large quantities; he keeps them all to himself, and I think he has made a good many thousand dollars from them. He lives here in Hennepin County. He has ten acres I think.

Mr. Gould. I was at Mr. Lord's place first in August and I might have seen his plants in September. He had those two kinds, Ancient Briton and Snyder, and as I was somewhat interested in them I asked as many questions as I could think of. I remember of asking him which he liked the best, and he didn't give any great preference as I remember, except that he considered the Ancient Briton a little the better producer. I was there again in October, and he told me that he was about covering his blackberries; I told him I was very much interested, and so he said he would light a lantern, and go out and cover some; he practiced this method that has been described here, that is of digging away from the root of the plant a little and doubling them down in a row. He commenced at one end of the row, bent them all in the same direction, and gave them a partial covering with earth. He makes a success with that style of covering.

Mr. Harris. I have had berries from his plants, and they are very nice.

Mr. Sias. Blackberry culture has been, until within a few years, almost a total failure. I recollect of seeing but two places where they were covered; one where they were growing the Ancient Briton the vines were well loaded with fruit. I am satisfied that there is no trouble about blackberries, provided they are covered in the fall at the proper time. Last fall I covered nearly all of mine for the first time.

Mr. Tuttle. I would say in regard to covering, it is necessary to turn them over in the way described, but not to cover them entirely; bringing them to the ground I think sufficiently protects them. Our canes are so large and so many in a hill it takes a good deal to hold them down, and I try to keep them to the ground. We went through last year and just put enough dirt on to keep them to the ground.

Mr. Wilson. I think success with blackberries depends a good deal on the kind of soil. I have seen them grown where I don't think more than one crop was obtained in five years, and they were covered.

It is most important to put them where they will stand the drought.

Mr. Smith. Mr. Kellogg has mentioned the kind of treatment that will always prove effectual. After you have taken them up in the spring, give them a thorough mulching; that will retain the moisture through the summer drought.

Mr. Harris. Mr. President, it strikes me that we have brought out about all we can until we get some papers on that subject, and I suggest we move on to some other part of the program, or else we will not get through.

REPORTS FROM LOCAL SOCIETIES.

The following report by J. E. Northrup, Secretary of the Hennepin County Horticultural Society, was then read.

HENNEPIN COUNTY HORTICULTURAL SOCIETY AND MARKET GARDENERS ASSOCIATION.

To the Secretary of the Minnesota State Horticultural Society.

The year of 1885 has witnessed a great development in the interests which form the aim of our Society. The membership has largely increased, the meetings have been well attended, the discussions animated, and the facts elicited therefrom, have been of benefit not only to the members of the Society, but through the reports of the newspapers giving the discussions in full, it is reasonable to suppose, that hundreds of farmers, and others interested in horticultural pursuits throughout the Northwest, have been benefited by its work. All this should serve to encourage each member of the Society to active and willing participation in its work; having in mind the fact, although it is not always encouraged as it should be, the work is no less effective in its results, or grand in its maturity.

The Society now numbers in membership seventy-six, in other words, has nearly doubled within the year just drawn to a close. At the fair held in Brackett's hall, Sept. 23 and 24, there were seventeen exhibitors of grapes, fourteen of apples, twenty-eight of vegetables, fourteen of potatoes, four of canned fruits and vegetables. A special premium of \$50. was offered by Mr. Henry F. Brown for the best display of fruits, the same being awarded to Mr. A. W. Latham of Excelsior. The special premium of \$25, offered by Mr. Gale for display of vegetables, was awarded to Mr. Wm. Lyons and Mr. H. F. Busse, first and second, respectively. In addition to these premiums of \$185 were awarded by the Society to exhibitors.

It is a matter extremely to be regretted, that I have to record the fact, that at the close of the fair, it was found that the receipts and the money in the hands of the treasurer of the Society were insufficient to cover the liability for premiums. This was owing to the fact that the Society was unable to obtain from the State, the money on which it had partially depended for the payment of its premiums. This was especially disappointing in view of the fact that, the Society had become incorporated under the name of the Hennepin County Horticultural Society and

Market Gardeners Association, in order that it might receive the benefits arising from the funds set aside by the State. And it was not until the share to which the Society was entitled had been applied for, that it was discovered, that owing to improper organization, it was debarred from securing the amount to which it was justly entitled. Steps are now being taken to remedy the difficulty, and it is to be earnestly hoped that before the next meeting of your Society, it may be rightly adjusted.

Despite the unfortunate termination financially, the fair was a grand success. The exhibition on a whole elicited on all sides, expressions of surprise, not only from visitors from abroad, but from citizens of our own County and State, to whom the exhibit was a revelation. It is an undeniable fact, that the showing of such a collection of fruits and vegetables does more to attract the attention of people looking for western homes than any other means that could be used. This fact alone, and the reflection that good is being done, not only in benefitting our State by developing its resources, but humanity at large by each new fact drawn out—of value—should be the reward of those who sacrifice their time and interests in this grand work.

The year 1886 opened with bright prospects. The meetings are held on Saturday of each week, at the rooms of the Northwestern College of Commerce, Prof. Asire principal, and thus far have been well attended.

At the annual meeting held Dec. 26, 1885, the following officers were elected:

President, J. S. Gray; Vice-President, G. H. Roberts; Secretary, J. E. Northrup; Treasurer, Prof. L. Asire.

Believing that the record of last year will be surpassed by that of the coming, I am sir,

Yours Respectfully,

J. E. NORTHRUP,

Secretary of Hennepin County Horticultural Society and Market Gardeners Association.

Mr. Pearce said the financial condition of the Hennepin County Society was by no means bad, though individual members had occasionally to come to its relief. Liberal premiums had been given, fifty per cent of which had been paid, and the balance would be paid within a month. The expenses for premiums, etc., amounted to about \$400.

The report of M. J. Hoag, Secretary of the Olmsted County Horticultural Society was then read.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

To the Secretary of the State Horticultural Society.

In compliance with regulations in the interest of Horticulture embodied in an act of Legislature approved Feb. 28, 1883, I herewith submit the annual report of the Olmsted County Horticultural Society, its receipts and disbursements and abstract of its proceedings for the year ending December 26, 1885.

Pursuant to notice the 13th annual meeting of the Olmsted County Horticultural Society met in this city on the twenty-sixth day of December at 2 o'clock P. M.

A. W. Sias in the chair. Meeting called to order. Whereupon President Sias read his annual address which was replete with interest and encouragement to the fruit growers of Olmsted County. An interesting and congratulatory letter from S. D. Hillman of Minneapolis, and a highly instructive paper on entomology from the veteran pomologist J. S. Harris of La Crescent, were read by the Secretary.

Treasurer's Report.

Balance of cash on hand January 3, 1885,.....	\$ 9.70
Received for membership fees,.....	15 50

\$25.20

Disbursements,	20.90
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Balance on hand,.....\$4.30

M. J. Hoag, Secretary and Treasurer.

Officers elected for ensuing year: A. W. Sias, President; W. O. Crittenden, Vice-President; M. J. Hoag, Secretary and Treasurer.

Respectfully submitted,

M. J. Hoag, Secretary.

MINNESOTA VALLEY HORTICULTURAL SOCIETY.

A report from the Minnesota Valley Horticultural Society being called for, the secretary of the society, A. B. Regester, of Granite Falls, responded and said:

Mr. Regester. I have no written report, but I will, with your permission, give a brief account of our society. A little more than a year ago—I don't know exactly when, and I don't think anybody does—we had a succession of attempts and failures, in regard to the organization of a society at Granite Falls; but about the 14th of February, last year, we succeeded in organizing; we had at that time, I think, twenty-two members. About the middle of July we held our first semi-annual meeting. We had quite an exhibition of fruits, beyond what we anticipated, and the interest was considerable; and between that time and the fair in September, our membership had grown, until we had sixty-two members. We have now a membership of sixty-eight. We held our first annual meeting a week ago to-day. We only held one day, three sessions; we had a grand time. We had no exhibits or anything of the kind, but a good deal of interest was manifested.

But I am a little ahead of my story. At the county fair at Granite Falls, we had a horticultural department, the same as at our agricul-

tural fairs, and that created quite an excitement. There was a fine exhibit of small fruits, jellies and canned fruits of all kinds; and that stirred up an interest at that fair, and in about a day and a half, we gained forty members, by means of considerable work. A week ago to-day we had our first annual meeting and elected officers. Mr. O. E. Saunders was elected President, W. J. Rice Treasurer, and myself Secretary. The interest in horticulture among our people is increasing, and I think there is no doubt that between this and the next semi-annual meeting, which will be held some time in June or July, we will have about a hundred members, and we anticipate getting even more than that.

So far as the finances are concerned we have no extended report to make; we have taken in some twenty dollars and we have on hand a part of it, and a part of it we are using to-day in coming here and going home. I think that is about all I have to report; if Brother Saunders has anything further to offer he will do so.

REMARKS BY MR. SAUNDERS.

Mr. Saunders. *Mr. President, Ladies and Gentlemen:*

I came here as a stranger to-day, representing, with my friend Regester, our society at Granite Falls. He and my wife and myself were chosen delegates. Coming here as a stranger to all of you, with the exception of Col. Stevens, with whom I have had a pleasant acquaintance for some time, the welcome that I have received here has made me feel at home, and I feel that I am among friends. In regard to our society I wish to add just a few words to what Mr. Regester has said, and I wish to say that we have not succeeded in getting the society on the footing on which it now stands without some hard work. It has required some effort to get our people to work there. We almost despaired of doing anything toward the organization of a society. When the matter was first up for consideration, it was said by one of our leading men in that section that they had tried to organize a farmers' meeting without success, and a horticultural society would certainly be a failure; but that same man is now one of our most active members. He was at our meeting and I think he felt we were alive, and although our society might not be more than an infant, it is a healthy one and bids fair to live. [Applause.]

Now, I would say that interest in fruit culture in our section has been at very low ebb, but we are able to report to this body that there is an increase of interest up there. Five years ago I was told by

people there that I could not raise fruit—couldn't raise strawberries—and it was an impossibility to raise apples. But I was not discouraged; I came there, notwithstanding this report, and I have raised fruit in Chippewa County. The influence that a few have had there in persisting in this matter of bringing forward the claims of fruit raising has done a good deal to place fruit raising on a successful basis in these western counties up there.

Our meeting last Tuesday was wholly an experiment, and we didn't know how we would succeed. We arranged to have three sessions and we sort of made up a program. We put in enough papers we thought to fill up the time allotted with discussion. Every paper was presented, save one, and that was caused by the ill health of the person; and those papers elicited most earnest discussion. Every man was ready to respond to anything that was asked, and the discussions were so interesting that we had hard work to get them to stop. I expected that we should have some difficulty in drawing out discussion, but we had to put the brake on. When I was going to the hall in the evening, I met one of the editors of one of our papers at the door of the hall, and he said, "I am going to set out some fruit trees; I had been wanting to, but didn't know how to take care of them. I was into your meeting and heard your discussion and it brought out just what I wanted to know. Now, I can go to work in the right way." That is one instance of the good that has come of our society. You must understand, of course, that we have had failures there from inexperience and from the fact that our land is not in the condition it should be. It has not yet become thoroughly fitted for fruit culture but we are gaining ground and becoming more successful, especially in small fruits, and we feel confident that we will meet with ultimate success.

Mr. Sias. I have been very much interested in this report. I will say that I was present when this society was organized; also present at the second annual meeting. It seems that this new society is a larger one than ours during the first two years.

Mr. Harris. Mr. President, I have been very much gratified in hearing this very favorable report. It carried me back to those days down at Rochester, some nineteen years ago, when we were a weak and feeble little institution; and yet our Society has become a power in the State, and I think that it will grow till all our people are interested in horticulture. I would move that we furnish this new society at Granite Falls with one hundred copies of the report of this Society for 1885.

Mr. Smith. I was very much interested in the report of this Minnesota Valley Society; and inasmuch as it may encourage the members of this Society to do what they can in aid of local societies, I will tell you why. I went out to attend a farmer's institute in Chippewa County two years ago, and I met Mr. Shannon of Granite Falls, and I gave him a report of the Minnesota State Horticultural Society. After he had read it one evening he said he wanted a membership in the Society, and paid me one dollar and I gave him what back reports I had. About two weeks afterwards I got a letter asking me to write back, giving the form of a constitution; I did so, but in two or three weeks more he said it was no use, the people would not take any interest; but he kept talking it up, and last winter he attended our state meeting, and he said they were going to have a county society. That man was working over a year before seemingly accomplishing anything. Now, he has gone away from there, but here is a society of more than sixty members. These reports ought to be in the hands of farmers as far as this Society is able to put them. I simply throw out this suggestion for you to think about. This splendid showing in Yellow Medicine and Chippewa Counties is the result of good seed sown years ago.

The motion of Mr. Harris was then adopted.

Mr. Saunders. I didn't anticipate any such result, but allow me to present to the Society the congratulations and the thanks of the Minnesota Valley Horticultural Society for the very favorable notice this Society has taken of our society in that section, and as delegates from that society we will guarantee to do our best in distributing these reports where they will do the most good.

I wish to make one additional statement to show the interest that is being taken. Last Saturday, when I was waiting at the depot to come down here, I was talking with some of our citizens, and there was one gentleman asked me, "Why didn't you carry your meeting into the next day: you didn't get through; the papers were not half discussed?" We told him we had only made arrangements for one day, and couldn't very well exceed that. Another gentleman said, "The next meeting you must make two days; with the interest that was manifested, you will not be warranted in giving less than two days." You may think we feel a little pride in this matter; but I think it is a proper refinement of pride. We don't claim the honor for ourselves, but we believe that we are working in a good cause, and one that will redound to the good of the people, not only in a financial

point of view, but in the better health and the more wholesome food it will bring, and in the aesthetic feature of the cause, it will elevate the sentiments of our people by surrounding their homes with fruits and flowers.

Col. Stevens. I would state that I was at Granite Falls a year ago last September, I think it was, and I saw some very thrifty gardens there, and I saw some pretty good apples there too; I saw the Duchess and one or two other varieties that I didn't know, and the names were something new to me, and they were apples that were apparently comparing well with any that we had. Another thing I noticed in the neighborhood of Granite Falls, and that was their timber lands. I saw trees that had made a mammoth growth in one or two years. I was very much surprised to see the enterprise displayed by the people of that part of the State.

Mr. Saunders. You would have seen a better display there this fall.

Mr. Edson Gaylord, of Nora Springs, Iowa, delegate from the Iowa State Horticultural Society, was then introduced, and presented the following paper:

ORCHARDING IN THE NORTHWEST.

By EDSON GAYLORD, Nora Springs, Iowa.

Mr. President, Ladies and Gentlemen:

We will use our best endeavors to confine our remarks to such points as we have proved to be of the most particular value in growing an orchard for home use during the past thirty years, leaving the commercial orchardist to care for himself. In touching so many points as we are seemingly obliged to, we hope to be excused if we appear to be dogmatical in our statements, for no one more than ourselves would more cheerfully stop, and give with the greatest pleasure the thousand and one reasons why we practice and advise others to try the following methods in growing an orchard here in the Northwest. The first apple trees set in Northern Iowa, so far as we have been able to learn, were set on our present orchard site in Floyd county. We then considered this site the best that could be found. After years of persistent efforts in setting and resetting we have been most thoroughly convinced that our site is one of the most difficult to successfully grow an orchard, that can be found in the Northwest.

Our soil is aspen, white and jack oak, elm, hickory, and black walnut, the first three proving best, the last three poorest. It was not till after many years of repeated failures that we could be convinced that our worst troubles came from a source we had so little thought of. Our orchard was so completely shut in and protected by thick, tall timber embracing some over five acres. The first twenty years we set and reset a few of all the leading kinds that came well recommended. Succeeded partially now and then, but more often failed entirely with many kinds.

Finally we stopped short and seriously considered the situation. We soon saw the little knowledge we brought west about growing an orchard was only a damage to us. This we demonstrated most thoroughly as soon as we went over the country comparing and examining the orchards and trees as we found them on all kinds of soils, slopes and in all conditions. Every tree bearing evidence of the most potent character, showing by its own conditions that there were certain conditions which would invariably bring about certain results, the conditions of different trees of the same kinds being almost invariably the same under the same surroundings. In short, certain combinations with similar surroundings almost invariably produced like results. Thorough and numerous examinations soon convinced us that what we had not learned about growing an orchard in the Northwest would fill a large book. Our first and most important discovery was finding many orchards on the bleak prairies on northern slopes, entirely unprotected or cared for by those who had but little knowledge and less experience in orcharding, doing fifty per cent better than those under opposite conditions. This soon convinced us of the truth and falsity of many theories we had formed while toiling in our orchards at home. What we had been so long guessing at we soon demonstrated. Our false theories went like brush to the bonfire, and our proved ones like choice wood to the wood house for future usefulness.

We would say first to the amateur, go and bury every idea or thought you have brought here from other climates about growing an orchard. This done, you have taken the first and best step on the road to success. Failing to do this, your blunders and failures will be endless. Second, secure your trees from reliable nurserymen who would much sooner lose the sale of their trees than their reputation for honest dealing. Unknown agents have swindled the Northwest out of millions of dollars, and as a rule those who have been the most successful have left with us the most worthless trash. Third, our first choice for a tree to set is one with extremely hardy stem, one grade more hardy than the Duchess, and grown on its own roots, top-worked three feet from the root with the best kinds which are as hardy, or nearly so, as the Duchess would be grown on its own roots. This will add full twenty per cent toward securing better quality than can be grown in any other known way. Fourth, our second choice is to have trees started on a two-inch root and a six-inch hardy cion, having the principal roots grown from the cion. We protest against two common plans: one, having our trees grown mainly on indiscriminate roots; the other budding into common stock grown from seed brought from Michigan, Ohio and New York. Either of these plans should be sternly rebuked, and will be by honest nurserymen. Fifth, give us neither wet nor dry soil. The advice so commonly given by writers to select a rich, warm, dry soil, often leads to bad results. Good corn land is all right, but extra good corn soil seldom fails to ruin an orchard sooner or later. Sixth, the best slope is northeast; worst, southwest; north is better than south; elevated lands better than low. Seventh, no protection on either side except south. Eighth, make your orchard self-protecting first by setting each tree in the second row south about two feet to the west of the one nearly opposite in north row, so as to have the south tree's shadow strike the north tree at half past one. The shadow of trees being much longer in Winter than in Summer, they will when thus set, shade and protect each other at the exact time and place they most need protection from the steady direct

rays of the sun which so seriously injure our trees during the cold, sunny days in February and March. Ninth, in Minnesota we would set trees fifteen feet apart each way. Set them from two to ten inches deeper than grown in nursery. Leave the hole on the bottom a little sloping to the one o'clock sun. This will help much in keeping a tree growing the same way. Be sure when setting to point the heaviest and thickest branches towards the sun at half past one o'clock.

Set them firmly; and as soon as the trees are about to leave out, cut all the leading branches on the northeast side, clipping in the ends of the twigs on the sun side with a view to close up all openings from the steady unbroken rays of the sun. Small limbs are seldom injured by sunscald and we have never seen a dead spot on a tree caused by the sun, unless the rays are unbroken for two hours and a half and never only when the stem or branch leans from the sun. Some think these dead spots caused by sunscald are always on the south or southwest side. We have often found them from where the sun strikes the tree at ten o'clock and all the way around three. We mean by this that a tree that leans northwest will be killed on the southeast side. If it leans northeast it will be killed on the southwest. If it leans southeast it will be found dead on the northwest side as far as three o'clock. These lessons are not only found in our orchards but all through the openings on the walnut and butternut. They are frequently found on the hard maple and pig hickory trees. Follow the above plan for setting and keep them so trimmed. One tree thus grown will be worth ten fine high symmetrically topped trees we read of so much. It is a fact known well to old observers that ninety-nine trees set as they commonly are with fine even symmetrical tops will at the end of five years be found making more or less to the northeast. And in making northeast they are making toward ruin. Grow such crops in orchards as will best prevent the ground from thawing out in winter or early spring. Many orchardists are recommending clover in orchards. We have serious objections to clover. It harbors mice and rabbits; it fails to hold the frost in the ground as even as other grasses; and what is worse than all we think it helps to produce blight. Potatoes we deem one of the worst crops to put in orchards for reasons too plain to need comment. We have tried high tops and low tops, now prefer medium. Think this is of less importance than when we set trees perpendicular. Now we would sooner have a tree with five feet stem leaning slightly to the southwest, or to half past one o'clock sun, than one with only one foot leaning northeast.

Eleventh, just how, when and why, our trees are so generally making to the northeast is still a disputed question. But that it is caused by the steady and uninterrupted rays of the sun during February and March, in nine cases out of ten we most firmly believe. This we argued many years ago but published nothing till 1879, in Iowa Report Book 1879, page 317. At that date no one living, as we have ever been able to ascertain, held the same views as we did. The next year Hon. R. P. Speer of Cedar Falls published his views (on page 151 and 153, Book 1880 of Iowa Report). We give now a few of the most prominent men who sustain these views: Prof. J. L. Budd, H. W. Lathrop, Jonathan Thacher, S. I. Foster, P. M. Gideon, A. J. Haviland and a host of others are fast falling into line. We have observed and reflected much on the propriety of growing three trees in one hole. Twelfth, we have observed a number of such conditions in various orchards. Each top will diverge from the others and in doing thus, protect each

other much more than one would at first think. Thirteenth, we manure our trees when they are not making at least six inches growth. Also when we find a tree is very heavily set with fruit. Without this in either case the tree would be liable to starvation and death. Fourteenth, we mound up with about half a bushel of earth to each tree in Fall, to protect from mice, and we prefer to leave it there through the Spring to prevent the round-headed borers entering the bark as they always do near the collar of the tree. The mouse very seldom climbs up a mound of clean earth to gnaw a tree. Fifteenth, to protect from rabbits, we set an old-fashioned box trap baited with sweet apple, carrot, or corn, or hunt his hole and drown him out with two pails of water turned suddenly into their holes; if in the ground, will bring them up quickly. We often whitewash the trunks with a mixture of lime, clay, sulphur, and snuff, with good results. Tie newspapers about trunks, but never use tarred paper.

STOCK IN ORCHARDS AND BLIGHT.

Of all stock in orchards the pig takes the lead. His omniverous instinct leads him at once to duty and usefulness. Our most injurious insects are hidden in the imperfect fruit which falls prematurely and when left as it commonly is will bring forth and multiply to an alarming extent. All secluded nooks and corners, old piles of rubbish and bunches of brush with grass and weeds grown up through them form the insects' paradise. The pig possesses a wonderful degree of push, search and research; in fact there is nothing so finely hid that his constant search will not find out, upset, turn over, root to pieces, scatter, tramp out of existence. And if the old sod needs stirring up and renovating he will do it without being coaxed or told. He is a most willing servant in his place; and that is in the orchard from spring till time of gathering; and then immediately after.

Some say he is unbecoming in the orchard, but we have not unfrequently felt more indignant toward some pigs who never were so favored as to have the use of as many legs as the one here referred to. We say of blight for those who are troubled by it: Seed your orchards to blue grass or timothy; remove all protection; keep away all manure; cultivate but little, and mulch thoroughly with light material, straw, tomatoe, or potato tops, fine brush or evergreen boughs. For particulars see our article in WESTERN RURAL on Blight. Our views have not been changed since then. We do not hold to the common idea that some in Minnesota do, that the Transcendent engenders blight and then sends it to its adjacent neighbors; while many think its conduct will warrant them in so believing, we feel sure that the evidence when better examined will not sustain such belief. The worst blighted orchard we saw on our trip of five days observation the first of July last, was one facing south shut in close by groves and buildings on north and east and was literally a feeding lot for a host of hogs and had been for some years in the past.

We mulch when the ground is frozen in early winter to keep the sap dormant till proper time for trees to start in spring. In 1884 we mulched with six inches of snow and three inches of frost. We then doubted the utility of our mulching with so little frost in the ground. In January we thoroughly examined our orchard in

all parts with iron bar and found no frost. Think our mulching did more evil than good as it kept the ground too warm in winter and spring and the sap more active out of season. In the fall of 1884 we had so far conquered the unc congenial conditions by our new methods of setting, trimming and top working that even from our worst of all orchard sites we sent to New Orleans the finest specimens of Wealthy, Wolf River, Dyre, Fall Orange, Pewaukee, Bennonia and many others of like quality. We then felt that we were only one round below Pomona, even then we had our arms raised to embrace her. But spring came and where was our ladder we had labored from early manhood till old age to build. Alas every round nearly to the bottom broken and fallen all in one rude heap, with a world to pity but no hand to save. Now as Buddah to Kilvana said, nothing can save a child that's dead.

PRESENT OF ORCHARDING IN NORTHWEST.

To say that we are plunged in a gulf of dark despair would but feebly express the sad condition we are in. No soil, slope, setting, leaning, trimming, protecting, exposing or mulching, has saved our orchards. But there appears before us a new lesson, and difficult as it may appear to us, we must search it out before we can reach the goal of success in the Northwest. Nearly everybody looks upon the causes of our calamities as something entirely new; we do not. It is only a new combination of the same old troubles we have been battling for years, viz.: excessive cold and untimely heat. We have studied this much, and differ with many. We have held for many years that our principal trouble has come mainly from untimely heat rather than excessive cold. Cold injures and kills many tender trees and shrubs but always shows first at the tips, keeping pace with the thermometer in its downward course. In excessive cold the twigs of some kinds we call hardy appear to be injured but in this case the balance of the tree will remain uninjured. We have shown our most hardy kinds to be much more discolored in the twigs when the mercury sank no lower than fifteen degrees below zero, than they were last winter with mercury below forty. The true cause of our present disaster lies in the fact that the various elements were combined in an unusual manner. The snow fell before the ground had frozen. Potatoes growing wherever we grew them the Summer before. We have seen the like in other climes but never before here. Have known the snow as deep, have seen it go off with the sun as late, have seen it unfrozen when the snow fell, have seen it drift as little, but some of these conditions were differently combined from what they were in the Winter of 1884 and 1885. Orchards received their first shock from a warm spell late in the Fall before the ground froze. Nextly, warm sunny days in February and March which melted the snow and settled it much, calling up the sap sunny days and suddenly freezing it nights while up. This was often repeated. The first week in May we had a very warm spell, everybody was hurrying up for planting. Some had planted, but on the 7th of May, when the blossom buds began to show red on the crabs there came a remarkably sudden change. The northwest wind came sweeping down from the way of Manitoba, making it so excessively cold that we could not run our planter for cold and frost. These conditions continued three days unchanged.

Water tanks that had been uncovered froze up worse than they had been during the whole winter. We had to chop the ice out of our watering troughs for stock to drink. This was the third and last shock, and how could we have expected anything more than a general destruction? Here we beg to insert two items which have come under our immediate observation. We have hundreds of others to demonstrate the position we have taken, that cold is not king in the destruction of our hardy trees. John Cline, of Panora, Iowa, has an orchard with two ridges running east and west through the center of the orchard. Has some ten different varieties in rows running north and south over the ridges, and across the two sags; the snow blew off these ridges, settled in the sags, freezing on these ridges and not in the sags. Each of these varieties as they passed over these ridges were left alive, those in the sags (with ground unfrozen) of each variety all died. Andrew Peterson, of Waconia, Minn., west of St. Paul, on an exposed, high, elevated site, takes all the premiums on apples at this meeting, in Jan., 1886, while J. S. Harris, down in the southeast corner of Minnesota, in a snug, cozy, protected site, close surrounded by the Mississippi timber, her high bluffs, and high ridges, with all his care and skill, which is not equaled by anyone in Minnesota, if in the Northwest, has not the first apple on exhibition. For many years in the past he has had the honor of carrying off the great share of blue ribbons. If our theory is not correct then Mr. Harris' place must have been the coldest, and Mr. Peterson's much the warmest. We have facts without end to show that the same varieties of trees grown in thicket form, or under protection from sun have come out entirely unharmed, while those on same soil and same conditions as to site (excepting their exposure to the warmth of the sun), have been killed dead.

If it was untimely heat then let us be prepared to guard against the like in the future, which we can. But if excessive cold, as many affirm, we are lost with but one road left to retreat and that across Behring Straits.

We examined the twigs nearly every week from December till May. We found the tender kinds killed back, some more, and some less, some to the ground; but our well known iron-clads were only slightly discolored leafing out nearly to the ends of the twigs while their trunks were badly discolored. We trimmed every month all Winter to test winter pruning; observed no discolored wood until the last day of February in the trunks. Now if cold was king will some one answer a few questions: 1. How the bodies of our most hardy kinds showed more injury than their twigs, and why such kinds should leaf out almost to the last bud? Why were chestnut trees standing single, ruined while those near by standing in close thicket entirely uninjured? This answered, will you next tell us how it happened that one orchard in our township facing north had always been up to 1884 and 1885 remarkably thrifty and productive, while the other cornering this but facing south had been one of the poorest but came out last Spring full the best? Why, says one, that is perfectly easy to answer. The one facing north without any protection received the greatest amount of cold. So we thought the first time we examined these orchards. We felt then that all our labor to show that trees the most exposed to cold came out of winter the best was scattered like chaff. We had for years held this north orchard as being one of our most conclusive evidences that a cold slope without protection was better than the opposite conditions. After studying these conditions in these two orchards a few days we went and re-examined them

and learned the one north had been left the summer before to grow up to a heavy thick growth of grass and that it stood undisturbed all winter. The south orchard was planted to potatoes and other light crops such as left the ground nearly in a nude condition. Here we saw the whole thing in a nut shell. What we thought had ruined our former arguments on this subject you now see turned out when properly investigated to be one of the strongest evidences in favor of our position. The snow coming as it did caught the north orchard entirely without frost in the ground, holding the roots all the time in readiness to send up the sap at the first call of the sun. The same sun that melted the snow called up the sap day after day and at the same time freezing it solid at night. The sap passing up in the inside as it does and coming down on the outside in the inner bark and sap wood growing thinner and cooler as it must in its downward flow, would as a matter of consequence commence to stop by freezing outside at least a few minutes sooner than the sap would stop pressing up on the inside. This action would cause a superabundance of sap to gather on the inner bark on the trunk which by sudden and severe freezing would cause the bark to loosen from the trees, as was the case with many trees in this north orchard. The south orchard being nearly clean ground froze some three inches just as the snow commenced falling, which helped to keep the ground cooler than in the north. Had we all gone to work and cleaned the snow away from the trees as we talked of doing a number of times during the winter we have no doubt but that our trees would have come out last spring.

That we may not be misunderstood on this great and leading point now so much attracting the attention of the progressive orchardist, particularly throughout the Northwest, first we say, we do not pretend to claim that excessive cold alone does not kill many tender varieties. This we admit. But we do not admit that the most hardy kinds are injured as much from excessive cold as from untimely heat which starts the sap out of season, and suddenly freezing catches it up in the tree above ground or above snow line, and in this condition the sap wood and inner bark are so much and so suddenly enlarged from their normal condition that the sap cells are so broken up and injured that death follows. Any unusual warm spell followed by a sudden freezing at such times as when the leaves are off in fall or winter, or when they may be partly formed in spring is almost sure to be followed by disaster, particularly so if the ground is not frozen when the warm spell occurs.

Orchardists should consider here in the Northwest how best they can secure the freezing of the ground early in the fall and hold it so till time for trees to leave out in spring. Our plan is to seed to grass and soon as the ground is well frozen mulch thoroughly.

The ground in 1884 and 1885 was not frozen from fall till spring but very little, and this mainly where the earth was by accident or in other ways made bare.

FUTURE OF ORCHARDING IN THE NORTHWEST.

Shameful ignorance and alarming stupidity, has marked our path while attempting to produce choice, hardy apples here in the Northwest. Look back on our track and see how uncertain and unreasonable has been the course we have been pursuing till recently. The seed to grow our stock, for roots to start the kinds we now have have been grown in Michigan, Ohio or New York; not one in a thousand proving valuable as standard trees. These results are nothing more than we

should have seen long ago. You say you did, but how could you have helped this since this was your only choice? This you say, you had to accept or remain idle, and who, in all this Northwest ever saw an idle or lazy horticulturist? Such conditions are not in the nature of his surroundings. If any set of men have ever followed the old moth to try, try again, it has been the orchardists of our Northwest. But his misspent energies and wasted means have brought him to penury and want. He has been forced to fall back on his resources and use the most rigid economy, or take to other callings. No one need envy the wealth any orchardist has gained in the Northwest. We would deem it no more than an act of justice should the State of Minnesota exempt from taxes each forty acres which shows five acres of orchard property set and cared for during the next five years. The State should take the matter in hand of experimenting and growing new varieties of apples, plums and other fruit. This play of chance should be played out. It has wrought the ruin of many of our best citizens. We have been lo, these many years striving to procure valuable kinds for the Northwest by planting seeds from such tender varieties as have not had the least shadow of a chance for success. We have tried long enough to get the kind of blood we so much need to make orcharding a success in the Northwest. We have not once stopped to reflect or reason on what we were doing or how we were doing. Like children we have been playing blind man's buff, catching at this and guessing at that. We advised many years ago to grow no trees for the Northwest except from seed grown in Minnesota. Had this course been pursued we should at least have had more hardy kinds than we now have and much superior in value. To be convinced that we were pointing towards a more direct road to success, you only need to examine the results of the well directed labors of C. G. Patten of Charles City, Iowa, who took up this same train of reasoning some years ago and went to work with a well defined object in view. He selected seeds from the best hardy kinds grown there, and now he has a show of fruit and hardy trees that will surprise any orchardist in the Northwest. Some of his trees are heavy bearers, good in quality and perfect models of trees as to hardiness. The contrast they show, surrounded as they are by all of our old standard varieties which scarcely have life sufficient to leaf out the coming spring, is truly worthy of a personal inspection by any interested in growing new varieties from seed.

Apple trees grown from seed grown as far north as Minneapolis, would give us a good chance from which to select such hardy stock as are at least one degree more hardy than the Duchess, and *on such stock* we could grow with reasonable success such choice varieties as have been grown *on their own stems* as far south as the center of Iowa. This course would advance your chances of success at least twenty per cent beyond any other direct way now known. Many individuals have been pursuing this course the past few years with marked success. But bear in mind the stem and root must be extremely hardy to make a success of this plan. The Wealthy in northern Iowa top worked on crab stock have borne us a good crop this season, while on their own stems very many have failed entirely with only now and then a tree on its own stem that has borne any more than to keep up the credit of the tree. Here we come to a full stop and find ourselves switched off on a side track with little other show than to remain, except taking to the long circuitous route which would take us through centuries of labor in acclimating the more

choice varieties to endure the sudden and extreme changes so common to the Northwest. Our direct road to success is through the Russians some of which will prove hardy, fair keepers and passable in quality. But our richest results will be brought out as we believe, through some course not wholly unlike the following which we here sketched for your careful consideration. For site select the most favored location known in America where the richest and choicest kinds can be successfully grown. But to secure the finest flavor and better assist nature in acclimating the new seedlings to the Northwest, we would fix the site on the northern limit of sure success. Select sound, vigorous, healthy trees, two or three of the best standard hardy kinds, and top work each with three or more kinds. For Minnesota use the best Siberian, the best Minnesota seedling and the best long-keeping American apple known. Those whose identity has been thoroughly established for hundreds of years both for keeping and for quality. These combinations could be so formed as to suit almost any taste and all future requirements. Then just as the trees were about to blossom we would have a frame so made as to readily receive a fine wire screen which could be fastened on leather strips so as to roll up and unroll as the occasion required. These screens could be painted white to keep them from rusting as well as reflecting too much heat. They would only be needed some ten days when they could be taken off rolled up and stored away for each successive year. This would effectually prevent the chances for the trees thus protected being pollenized by spurious kinds through the agency of bees and other insects. But to make this plan sure and complete there should be no other kinds growing near on the outside for fear the pollen might find its way through the screens. While these are our best thoughts on the subject, we have no doubt but that there can be many amendments made to these suggestions with profit. A swarm of bees might be placed in each apartment to insure more perfect mixture of the pollen. When the fruit is ripe the seeds should be saved and sent as far north as Minneapolis to be grown and cared for properly. By doing this we would soon learn which of the fittest would survive. The south side we would board up tight and let it so remain the year through. This would protect much from untimely heat in spring, from oppressive heat in summer as well as from the direct rays of the sun in February and March which causes sun scald.

We have the strongest confidence that some plan similar to the one we have attempted to describe would lead us directly out of the wilderness and at once secure to us much more valuable trees than we have secured through all these many years of struggle. Trees that have commenced bearing could be secured, and the work commenced at once, and rich results would follow one after another in quick succession. We think this plan simple, and perhaps it is too much so to attract your special attention, but if you should deem it practical then we shall not be sorry for making these suggestions on this the most important part of all that pertains to success in orcharding in the Northwest. It appears to us that one thousand dollars a year would cover the entire expenses for ten years to come; and at the same time relieve the thousands who are now wasting so much time and money on foolish and unwise experiments such as have brought so much ruin and failure over the Northwest. If the great State of Minnesota cannot be induced to lead out in this alone let her make the effort to join with Wisconsin and Iowa and divide the seed and grow each its own as it may deem best

Mr. Harris moved that the Society express its appreciation to Mr. Gaylord by a vote of thanks for the paper, and that he be made an honorary member for the term of five years.

The motion was adopted.

Mr. Gaylord. Gentlemen, I rise to thank you for this mark of your appreciation; and I can only say that I will be very happy in returning the compliment by doing what I can to see that you are well treated by our society should any of you visit us. In Iowa we are interested in helping you along as far as we can, for we are working under similar conditions, and your labors have been helpful to us.

THE BLIGHT QUESTION.

Mr. Whipple. I would like to ask you in regard to blight, whether it is still existing in Iowa.

Mr. Gaylord. The blight is not in my orchard although it used to be. It is in others. I think I have got one of the worst places for blight in the world; I have never seen any place that I thought could beat it. If you want to produce blight I will tell you the most certain way to do it. I would select a warm place, lying to the southwest; shut in by timber; plow and cultivate well, manure thoroughly and set out your trees; and then with a long, warm, dry spell in June, followed by rain, about two showers a day, and I would be sure the trees would blight. Now, if these are the worst conditions for producing blight the opposite is the best. I want a northeast slope for my trees. I believe it is a miasmatic poison, something similar to that which rusts our wheat, rising like an exhalation from low ground; it will come up similar to a fog; not moist like a fog, but dry. I don't know how I can better explain what I mean. I have studied this subject a good deal. It seems to be a dry substance which rises from low ground and is carried along in currents by the air. When I say a current I don't mean a wind, but if there is a little air moving, there it will attack your trees. There are certain trees that are more subject to blight than others. In Minnesota you are troubled with blight more than we are, I think, from the fact probably that you have very short, warm summers; your trees grow fast; you take care of them and give them protection to keep them from these cold chilling blasts of winter. Everything grows here much more rapidly than further south. And as you shut your trees in more, you furnish the most inviting conditions for blight to work in.

Mr. Whipple. Do you consider blight something that certain localities are especially subject to, or is it something that will finally pass away.

Mr. Gaylord. I think it is something that rises on every man's farm, and comes from the specially favorable conditions to be found.

Mr. Whipple. We have a little different history. The first appearance here of blight was where the city of Minneapolis now stands, and it has traveled west. Out where I am, fourteen miles from here, I used to have it in my orchard, but it has disappeared. Some trees have been nearly killed. Other orchards close by were not affected by the blight the same year. It seems to me that blight has been in the country about fifteen years. But I believe it is something in the air that will pass away after awhile. In my orchard there was no sign of blight this last year.

Mr. Gaylord. Another thing that affords a favorable condition for blight is the rapid growth of our trees. A tree will grow five or six inches in a week's time; the twigs are then very tender and that accounts for this dry, miasmatic substance striking the leaves and holding to them, and its being most destructive to the new growth.

Mr. Whipple. If that theory is correct, I would like to know why, when we were troubled with it here, it wasn't known some fifteen or twenty miles west of here. It is on trees further west, twenty or twenty-five miles west from here. If it is in the atmosphere and certain conditions bring it on, why does it not trouble us one year as well as another?

A Member. Another thing about blight, if you commence cutting off the blighted part, you will kill the tree, I don't care if the tree is a foot through.

Another Member. I let them stand the first season, and cut off the blighted part the next year.

Mr. Tuttle. I have never found any man that fully understood the cause of blight. I have talked with Prof. Berry and others, and they all agree that it is something that comes and goes. We don't know why, and we don't know when it will disappear. Mr. Downing said it appeared in his vicinity, quite a number of years ago; it left there, and for some thirty years it has not returned. I know in Wisconsin for more than fifteen years we never saw anything of blight. I don't know why we didn't have the same state of atmosphere then that we have had since. The first appearance of blight was on the Talmon Sweet apples; it was not confined to them, but

it was generally found on the Talmon Sweets. It was confined principally to that variety. The next year it took other varieties, while the Talmon Sweets didn't blight. It has been changing from one variety to another, and now it seems to be nearly worn out. There are some trees that are more liable to blight than others; there is the Montreal crab, and the Alexander, a Russian apple that are subject to blight. In regard to shelter, I have seen the worst blight where there was no shelter. I have seen Transcendent apple trees killed to the ground that were standing 500 feet higher than others that were not affected. The style of blight was the worst I ever saw on any place. In another place on the north side of the orchard, several Transcendent trees were as badly blighted as any I ever saw. I know that blight spreads. The same thing is seen in the oak. The black oak blights the worst generally. I had a fine oak grove, and for two or three years the blight was gradually spreading through it. It is going through it again now, in the same direction, moving northwest, and it will go through the whole grove. It is something that comes and goes. We don't know the prime cause of it. And certainly, I know of no remedy for it, unless it is putting your orchard into June grass seed. I think very likely that is the best remedy. Of course, the effect of blight is to destroy the tree so far as fruiting is concerned. I have a number of trees that were affected with blight; this year they died. But I haven't been troubled a great deal for the last ten years. Commencing on the present year's growth, I cut off all that is ruined. Where I see a black limb, I cut it off. It will stop the blight for that year. But I don't know of any remedy; I don't know what you can do with it. I think it is wearing out. I believe that we shall finally be rid of it, and in fifteen or twenty years we will be without any blight.

Mr. Nobles. I have a small orchard, and several of the trees blighted. I examined them, and cut off a limb, and found a little worm about an inch long. I have about seventy-five trees that I set out several years ago. The blight killed a good third of them, but did not kill many of my Transcendents.

Mr. Gaylord. When my trees are not looking well I put a little manure on them, or a heavier mulching. If they have all they need I put on ashes. Manuring will never hurt a tree except when it is loaded with fruit. I never knew trees to blight when I tried that. I use chip manure.

Mr. Nobles. I think that white-washing the trees will keep them

free from blight. I put on white-wash and a little clay with it.

Mr. Busse. I set out fifty trees eight years ago. I put a row of currant bushes between the rows. By working thoroughly I kept them clean. In two or three years they got from a foot to a foot and a half growth. I think it was in June 1880, they commenced blighting. I cut off the blighted part. They didn't blight any more that season. The next year, early in the spring, I put about half a barrel of salt around them within about three or four feet of the trees. I did that for two seasons and have not been troubled with blight since. At the same time a neighbor close by is troubled with it yet. I would say that the Iowa gentleman is very correct in his remedy, if he does not choke the trees too much with manure.

Mr. Somerville. I wish to say a word in regard to blight. I am not going to discuss the cause of it, but I wish to tell of the preventive used in my orchard. I had a large orchard of crab trees which were affected with the blight. I thought I would either destroy the orchard or get rid of the blight. I seeded the orchard to red clover, took the rings out of my hogs' noses, and turned them all in there. They rooted the ground all over and over around the trees, and since that time, for four years past I have not seen any blight.

Mr. Sias. It seems to be admitted that no one knows exactly what this blight is. My opinion is that it is some kind of living organism that gets into the cell structure of the wood. As Mr. Busse says, I believe that salt is a good thing to throw around trees if you don't throw it over them. You are very apt to kill the tree if you throw salt on the top, but throwing it around the roots I think would be a good thing. One gentleman recommends lime. Ashes, sulphur, and kerosene, anything that will destroy these minute, living organisms is beneficial. I believe it is something that moves in the atmosphere, as Mr. Gaylord says. It floats in the air slowly, and lights on the different trees, and runs in streaks through the country. Some years it is a great deal worse than others. A great deal depends, he said, upon where the orchard is located. I believe in wind breaks myself, but not in hemming in too close. Usually where I have seen blight was where I thought the trees were hemmed in too close.

Mr. Kellogg. Mr. President, I know of no subject that is so inexhaustible as this subject of blight; if you get out of timber, just take up this blight question.

THE DWARF JUNE BERRY.

The following question was then read:

Does any person know anything about the Dwarf June Berry, and is it worthy of cultivation?

Mr. Gaylord. I think it is what we used to call the Shadwood or Shadberry. I have a few trees from one of the best nurserymen in Iowa. They produce a very small berry. They don't amount to much except for the birds to eat. I have grown just enough to have a few berries to eat.

Mr. Smith. It makes a very pretty tree for a garden or lawn; the berries are small and of no particular value. There are quite a number of them in this city set in gardens. They are not as large as the common June Berry.

Mr. Harris. Mr. Gaylord, I think, has given us all the light we will get on it. It is recommended by men that are peddling it as very desirable, and the berries equal to huckleberries; they are selling the plants at a pretty good price. I don't think they are of any value except to feed your birds on.

Mr. Gaylord. It blossoms very early. The birds feed on the berries and like them, but for eating it is about as poor as anything you can get.

Mr. Sias. I supposed we had the common June Berry and the Dwarf June Berry growing wild in our county. I have heard considerable about the Dwarf June Berry being a good and fine fruit, and last fall I took pains to look around to see if there was any in our section. I found a good many, bearing pretty well, some of them I couldn't see any difference between the fruit of those called the dwarf and the common species; they were generally small. The fruit is about the size of a pea. I couldn't see any advantage in the dwarf over the common species, and I doubt if they have any large fruit such as they recommend.

Mr. Smith. The only particular difference I could see is in the size; the dwarf only grows about three or four feet high, while the standard grows to some height; they grow all along the road.

THE BLIGHT QUESTION AGAIN.

Mr. Harris. I would like to say a word about this blight question. I used to think I knew something about horticulture, but I don't think anyone knows very well what blight is. But my opinion is that what is called blight is a living ergot, or parasitic fungi, which

propagates itself and is carried in the atmosphere; it will propagate on our fruit trees. I have noticed that if we have a warm, dry spell just before strawberries commence to ripen and then directly a succession of warm showers, as Mr. Gaylord spoke of, I have known trees to make a growth of six inches in twenty-four hours. These shoots are full of water, and are just in the right condition to be affected by blight. It attacks the Transcendent first, then the Duchess, and everything else on my place. I believe where the wind works freest it is the least liable to find a lodgment, because years ago when I set out my orchard I set out a windbreak and at first when the windbreak was small and the wind coursed freely through it, I didn't have any blight, but it grows worse and worse every year. I have tried salt; it hasn't cured my trees of blight, but I find it is beneficial. It helps them to withstand the drought and makes the soil hold the moisture.

Mr. Smith. Two years ago I recommended hanging open cans of kerosene in the trees, as a remedy for blight, and I think it is an excellent remedy.

Mr. Harris. We have a blight, so called, that is caused by a twig borer. I have seen a little of that, but it only comes once in a good many years, and is not a permanent thing.

Mr. Nobles. I would like to say here that I have some apple trees closely hemmed in with cottonwood and maple trees and I am not troubled with blight. I have cultivated them for twelve years, and my apples bear every year; I have some trees set in the door-yard that are the nicest trees I have, and they were loaded with fruit this last year.

Mr. Gaylord. There is an insect of that kind; but it is not this common fire-blight; that is given up, I believe, by all our best men. Insects will work in after a few days. Where the blight touches the sap it fomented and works, and draws insects to it.

Mr. Harris. You can almost see that kind of blight grow. Take it about two o'clock in the afternoon after a shower, and after examining it a little while you can observe a change; the progress is almost perceptible, it grows so fast. In this kind of blight I have seen the insect that produces it.

Mr. Nobles. My orchard on the south and east is protected by soft maples, and west by cottonwoods, but if I was going to plant again I wouldn't have a windbreak within twenty rods of my trees.

When I first came here I was told to set them close to my trees; I did it but I wouldn't do it again.

Mr. Tuttle. I have had pear trees blight in a field, on ground that never had been cultivated. It was an idea we had several years ago that pears on cultivated ground wouldn't blight. I have trees on cultivated ground and uncultivated, and I can see no difference. They blight just as bad in one place as another. When a pear tree blights it is one of the worst of trees. We used to grow trees that never had a particle of blight, that bore good crops of fruit. I have trees that never blighted a particle, that are twenty-five feet high. I believe trees, generally, after they bear good crops, to be more liable to blight, but I have little faith in varieties that are originated in this country. If I had as much faith in the Russian pears as I have in the Russian apples I would look no further. I am trying the Russian pear; it seems to be perfectly hardy, but whether it will stand the blight, is a question to be found out hereafter.

On motion, the meeting here adjourned till 7 o'clock P. M.

EVENING SESSION.

TUESDAY, JANUARY 19, 1886.

The meeting was called to order at 7 o'clock P. M. by President Smith.

A paper by Wm. McHenry, on Blackberry Culture in Minnesota was read by the Assistant Secretary. Following is the paper.

BLACKBERRY CULTURE IN MINNESOTA.

By WM. McHENRY, St. Charles.

Mr. President, Ladies and Gentlemen:

As it is impossible for me to be with you at this meeting and feeling a great interest in the cause of horticulture, I will try in a brief manner to comply with the wishes of your Secretary and others.

My motto is "What one man has done another can do."

What varieties of blackberry are best adapted to culture in Minnesota? or have we any variety hardy enough to bear well in Minnesota without protection? I answer No, if so trot it out, for it is worth "millions."

I know when I make the above assertion I tread on many corns, for nurserymen's catalogues are full of testimonials of certain kinds that need "no protection;" and yet which it is alleged bear immense crops of luscious fruit. There are few of my

hearers, perhaps, that have traveled more miles the past year than I have, having visited one field of seven acres, and having sought practical information on this subject from every available source.

We are deprived of raising many of the most luscious of the larger fruits, and even apples, in many localities are a failure, as I could show you orchards in this vicinity where even the Duchess was killed last winter. And yet I have now on my table a catalogue containing testimonials reading like this; permit me to copy one :

"The Stone's Hardy Blackberry came through last winter without injury, without protection, although the mercury was forty degrees below zero several times. It is evidently an iron-clad."

This catalogue has two pages of such testimonials. Now, this man has a large patch and should have picked one bushel to the picking, and he told me he only picked one box at a time, (and yet they need no protection;) further his berry patch is very favorably situated, being surrounded by a willow hedge, also plum thicket, and other trees among the bushes, so that the snow piled in there nearly to the tree tops, yet he says this is "no protection." He only had a few berries.

But to my subject. Stone's Hardy is the best adapted to protection of any of the high bush varieties though there may be some of the dewberry family that might do well. It is a very rank grower yet it has a slender stalk, throwing its vigor more into side branches; it does not grow tall, and yet gives more fruiting wood than any other variety, which accounts for the immense crops of fruit produced. Hence it can be laid down for protection without breaking but few bushes.

The Snyder is also a vigorous grower sending out one very coarse, tall stalk with but few side branches, which accounts for its light yield of fruit.

The Ancient Briton, which has so much said in its favor by growers, is much like the Snyder in its growth, but has more side branches, hence it has more than double the amount of fruiting wood, but it breaks very badly in covering. I also have other varieties but do not consider them worthy of notice here.

MODE OF CULTIVATION.

I would prepare my ground by manuring heavily and thorough cultivation; then mark the rows eight feet apart. After the row has become established, or has been set two years, I would have the row one foot wide, and if I could would have a double row or have one bush to every six inches of space in the row; and thus the plants will stand one foot apart. It is best to keep the suckers down if you want choice fruit, this is easily done with a horse and cultivator. We often hear of blackberry patches that blossom full but the fruit dries away. We have had no such trouble with our mode of culture. As soon as the young bushes get eighteen to twenty-four inches high pinch off the tops of the plants and pull out where they grow too thick; this should be kept up for one month at least, or until about the time the berries begin to ripen.

PROTECTION.

As we have plenty of bagasse at hand and are glad to get rid of it we take a wagon with hay-rack on, putting on a long neckyoke. Load our wagon and drive astride the row and the wagon will bend the bushes all one way. One man on the wagon forks the bagasse off on the bushes; one man on the ground with a pitch-

fork in hand sees that all the bushes are held down and covered. In this way two men with a team will cover about one acre in three days. In the absence of bagasse I should use straw in the same way; or even coarse manure will answer the same purpose. Some recommend cutting the roots on one side of the bush, bending down and covering with dirt. I have tried this with very poor success, as the bush needs all the sap it can get to mature its fruit. I left one patch last winter of the Stone's Hardy without covering, but did not get a pint of fruit where I should have had a bushel had they been covered.

REMOVING COVERING.

As it is necessary to mulch your bushes all you have to do is, as soon as freezing weather is done, have two men with forks walk on each side of the row, removing the covering from the bushes; raise them up with the fork and place the covering under, or as nearly as you can get it; this keeps the weeds from growing among the bushes and also protects your fruit from being injured by drouth; the rest of the cultivating can be done with a horse.

TIME OF RIPENING, ETC.

We first went into blackberry culture with many doubts. Hence we only set three rows fifty rods long. From this patch we sold last year over one thousand quarts of very choice fruit at twenty cents per quart, and estimated over five hundred quarts on the bushes when the frost of September 1st harvested the balance. We have so much faith in blackberry culture that we have now three acres, and shall double that amount as soon as we can get the plants. I should have said our rows were not full, and we now have bushes enough on the three rows to double the yield of 1885.

As to the time of ripening of the three kinds above described, I would say, that we commenced picking Snyder August 1st; Stone's Hardy August 10th; Ancient Briton August 20th. September 1st, Snyder all gone; Stone's Hardy had but few berries left; Ancient Briton had not yet reached their best.

QUALITY OF FRUIT.

We had many visitors and with but few exceptions the verdict was in favor of Stone's Hardy. Any of these varieties are good enough for me.

A paper on Grape Culture, by Silas Wilson, President of the Iowa State Horticultural Society, was then read by the Assistant Secretary. Following is the paper:

GRAPE CULTURE.

By SILAS WILSON, Atlantic, Iowa.

Mr. President and Members of the Minnesota State Horticultural Society:

By the kind solicitation of your Secretary I have been induced to prepare a short essay on the grape.

Grape vines are among the most variable plants. Even in their wild state, in climate, soil, shade, humidity, and perhaps hybridization, have originated such a multiplicity and such an intermixture of forms, that it is often difficult to recognize

the original types and refer to the different forms to their proper alliances, only by carefully studying a large number of forms from all parts of the country, and after all this, we can only recognize the *Labrusca* and *Reparia* families of the grape as the only source from whence we get our valuable grapes. I have no faith in grapes of any other parentage, other than *Labrusca* and *Reparia*; although the Delaware is supposed to be a cross between *Labrusca* and *Unifery*. The Delaware has a poor leaf for the prairie States, but can be grown quite successfully in some locations in the Northwest by fertilizing and giving good cultivation, with winter protection.

The cultivation of this delicious fruit is too much neglected in the Northwest. I hope soon to see a new era in grape growing on the great prairies of the Northwest, and the best way for us to help bring that about is to quit buying such varieties as are usually grown East in hot houses from single buds, and forced to grow five or six feet in the space of two months, the *Prentiss*, *August Giant* and a host of that class of grapes, too numerous to mention. We should recommend and plant largely of *Worden*, *Lady*, *Cottage*, *Moore's Early* and *Janesville*—and plant for trial the *Empire State*. This is in my judgment the most promising new white grape before the public; it is a seedling of *Hartford Prolific*, fertilized with *Clinton*; thus you can readily see that it is a representative of both these valuable families of the grape; it is a vigorous grower with broad thick leaves very much like that of the *Clinton*; while the wood resembles the wood of the *Hartford*, it is early. I have seen it when about as early as *Moore's Early*, and the fruit is of high quality. I have great faith in grapes from this source. The *Niagara* grape, I am free to confess, is a surprise in many of the Eastern States, but I am afraid those that plant largely of it in the west will be surprised in the opposite direction from those of Western New York. I recommend pruning, and laying down vines in the fall as soon as the wood is thoroughly matured. The Delaware can be improved by grafting it to such roots as *Concord* and *Ive's Seedling*. I grafted last spring 75,000 Delaware cuts on *Ive's Seedling* roots with a good degree of success. The process is like that of the apple root grafts. I cut the *Ives* root in sections two inches long, and splice graft. The Delaware, cut seven or eight inches long and lap with a waxed thread same as with the apple root graft.

DISCUSSION.

Mr. Smith. To those not acquainted with Mr. Wilson, I would say that he has probably been as successful a grape grower as anybody in the country. He is president of the Iowa State Horticultural Society, and he has made a grand success of grape culture down there in Iowa.

Mr. Harris. I like the list he has recommended very well. It is probably just such a list as can be safely planted by most of the people in the West. We discarded the *Janesville*, I think, at our last meeting; but I thought at the time, and still think, that we ought to give the *Janesville* a prominent place in the list of grapes for common cultivation by farmers. It is sure to produce a good

crop where some of these other grapes that are later will not do anything; for instance, the Niagara grape, which is recommended by eastern men, we know nothing about it, and from what I have heard I have a very poor opinion of it. Both bunch and berry I am told are small, although the pictures we see of it are very fine. I understand the color recommends it. I have only tried it once or twice. It may be a fine grape for the East.

Mr. Tuttle. Mr. President, I don't see any particular use in recommending the Janesville. I consider Moore's Early a better grape. I have a Moore's Early vine, standing in the open air, which came out better than the Concord. It is hardier than the Concord, or the Janesville, and I got fully as good a crop as from the Concord. It ripens its fruit more evenly than the Concord, and is about twenty days earlier with me. I consider it the most promising grape to plant in any portion of the country where we have short seasons, where the Concord fails to ripen; I consider it the most promising grape of any that I know of. In quality and hardiness I have set it down as unexcelled by any other variety. Most of these new grapes that we saw advertised a few years ago at \$2, or \$3 a vine, can be bought now for ten cents apiece. Some have grown higher, showing that they have real merit in them. Moore's Early is pretty well known now, and will be known still more generally. I touch new grapes very lightly. I spent \$500 on new varieties that were very highly recommended. I would have done better if I had thrown the money in the fire. Since that I fight shy of them. I have full faith in the Worden and Moore's Early.

Mr. Pearce. Mr. Wilson has struck a very important point in regard to eastern grown vines and those of the West. I am, in a business way, personally acquainted with Mr. Wilson; have been for a number of years, and I must say that his vines give the best satisfaction of any I have ever handled. They are all grown out doors, and prove more hardy and more prolific than the eastern vines. I have tried the eastern vines, and got very poor satisfaction. Although you may have to pay less for eastern vines, I say be very careful when you say they are cheap. A few cents on the vine is nothing as between poor and hardy vines. Now, in regard to the Niagaras, I hardly know what to say. But, when I see so many hundreds of acres of that vine planted and so many hundreds of men getting the amounts that they do from the vines, and the price

per pound they get in all the markets, and then find other men condemning them, I hardly know where to place them. I would say this, however, that it is one of the most remarkable growers that we have. I have seen vines attain a growth of fourteen feet in one season. We had them on exhibition at our fair, some of those grapes from Lockport, New York. With the exception of two or three that were not quite ripe, they were pronounced first class; they were very large grapes, large bunches, and would be pronounced, I would say, excellent. I have been planting a few of them, and so far I am very well pleased with them. My vines are three years old; I have got them well shaped. I have also the Empire State. I am very favorably impressed with that variety. In the first place, it comes with the highest possible recommendations. The best authorities pronounce it not only an excellent grape, but free from all disease, coming from pure parents; and so far as my observation goes, I think the Empire State will probably be a success.

Mr. Smith. Mr. Latham, you have raised the Lady grape; what do you think of it

Mr. Latham. It is a very good grape; it is very early. I would recommend it planted with others.

Mr. Stubbs. Mr. President, I have had a little experience with the Lady grape. I live on Lake Minnetonka. So far as I have observed, it is not very thrifty on sandy soil, I have noticed on clay soil it did better, yet it seemed to be a partial failure. The vine seems to be hardy enough; I must say it is extremely rugged, and perhaps as sweet a grape as I ever tasted. Some seasons I have taken fruit from it by the 20th of August, although generally with me it is ripe about the 25th of August. I think the Empire State has more merit than any of the new varieties, and is one that we should not overlook from the fact that it belongs to the Labrusca variety which is allied to the white grape. It is as strong in its powers of resistance to disease as our wild grapes. There is no question but what disease has already made its appearance among our favorites, and it is going to be a hard matter to protect them, as it was in the eastern states. In looking for new grapes, the first thing to look for is a healthy, hardy stock. I planted a number of vines of the Empire State last spring, and they did remarkably well. The grapes ripened as well as any I had in my vineyard. Take it all in all, it seems to me from its parentage, it is one of the most valuable new grapes that has ever been brought out.

Mr. Gould. These new grapes are being offered for sale with high recommendations and people are buying more or less of them, and so I think it proper to discuss the merits of them as far as we know them. What I rose to say in particular was this, that there seems to be a craze for new and high priced fruits. That is all right, to keep things moving; something will come out of it, but I advise everybody that hasn't any money to throw away, to go a little slow. They come well recommended; they always do, if there is a good price. Now, I have been very cautious about expending money on new things; I tried it a little years ago, and I learned a lesson that has stuck by me so far. And notwithstanding this new grape, the Empire State, comes with such high recommendations, (and I believe it stands the best show of anything at present) still I am not convinced that it is all right. I think it is well enough to discuss these things, as I said before, because people are buying them. There has been quite a large quantity of the Niagara grape sold at very large prices. Well, my impressions on first seeing that grape, were that it was a success. I saw some of them last winter in solution, pickled, and I noticed that part of them were hung on the cluster, and part of them were in the jar. That aroused the suspicion that they had dropped from the bunch, and I have made some inquiries, and I have been told that they had that failing. That is a very great fault.

Mr. Latham. I had an opportunity to try the Niagara grape several times this fall. Some of them I tasted were passable; many of them were distasteful according to my idea. If these samples of the Niagara were the best that could be produced, I am not favorably impressed with it. I think it must be two or three weeks later than the Concord. At the time these were picked they were in the condition when the pulp parted readily from the skin, but at the same time they were unripe. I have never had a chance to test them when fully ripe.

Mr. Smith. I would like to inquire whether it is not considered later than the Concord.

Mr. Latham. Those were gathered at the same time as the Concord I should judge; they were shipping them at the same time that Concorde were selling. But they certainly must be ten days later.

Mr. Smith. In correspondence with parties in the East who are not growing them or selling them, but living where they have had good opportunities for judging, they have written me that it was

fully a week later than the Concord on the same ground. Now, if that is a fact (I don't say that it is, but that is what I have been informed,) I think it puts it out of our reach, as Mr. Gould says, entirely.

Mr. Harris. If anyone wishes to plant the Niagara, they can get a circular by sending to Mr. Hubbard, of the Niagara Grape Co. He will send vines for sixty cents a piece if you take more than ten. It is well to get one of those circulars.

Mr. Pearce. Are you correct about getting as few as ten at sixty cents apiece?

Mr. Harris. Yes, sir, I can get a single vine for sixty cents, and so can you.

Mr. Pearce. I think there is an error somewhere. I had a letter from Mr. Hubbard stating that his wholesale price was sixty cents; he gives those that buy the privilege of selling at sixty cents, or for just what they please, provided they don't sell for less than sixty cents, but you must take fifty or a hundred vines.

Mr. Harris. No, I think you can get any quantity; they don't ask for any contract, only they will not sell them for less than sixty cents apiece.

Mr. Sias. I have been urged to take the agency of the Niagara grape, but I have always refused for two reasons: first, because they are too late in ripening, and second, they are too high in price.

Mr. Tuttle. I think, so far as the Niagara is concerned, it is generally condemned in the West. It is considered a very valuable grape in New York and Ohio. Mr. Hubbard sent me some specimens with the request that I would give it notice; I have refused to do it. I think we have superior grapes, and if we get something out of these new kinds that will prove valuable, I shall be glad of it.

Mr. Bost. The Janesville isn't a vine that we ought to cultivate, on account of the poor quality of the fruit. From what I have observed of those planted in my neighborhood, I don't think we should encourage the propagation of it.

Mr. Harris. It is not a very good grape for eating, but is for cooking purposes very early, and I think most people would prefer it for cooking to all others. I think it is quite desirable, where you are planting vines for your own use, to have a few of the Janesville. It is better for jellies and some other purposes than the sweeter varieties.

Mr. Barrett. I don't rise to engage in a discussion of this matter, but I hope that this body will define itself clearly on this subject. Perhaps you may not be aware of the fact that this organization has a

great influence among the rural people. I noticed last year they sought the daily papers, to get the reports that appeared of our meetings, with reference to this and that, and whatever this Society recommended the people were desirous of procuring. We are troubled in our region with irresponsible agents who go through the country and see the farmers, recommending this and that, and the farmers are looking to this Society to get its recommendation of what is best. I hope therefore, that it will define itself clearly as to certain varieties. I am much interested in horticulture, although but a beginner. I just started a nursery in the vicinity of Traverse. My grounds are in Dakota, but I live at Brown's Valley. I came here as a voluntary delegate to learn all that is possible, and my friends defer to me, in a measure, with reference to the news of your meeting that I am to bring to them.

There is one thing that pleases me, and that is the tendency to conservatism of this Society in recommending new and untried varieties of fruit. I make this suggestion that the Society define itself positively in this matter, for the benefit of the rural class, that they may understand what to do.

President Smith. That matter will be more fully reported upon by the special committees.

On motion of Mr. Elliot the President then proceeded to read his annual address, which was received with applause, and on motion referred to a committee of three, appointed by the Society, consisting of Messrs. Wyman Elliot, J. S. Harris, and A. W. Sias, to report upon the same.

PRESIDENT'S ANNUAL ADDRESS.

Members of the Minnesota State Horticultural Society, Ladies and Gentlemen:

It gives me much pleasure to meet you again. And my sincere desire is that you may each and all have a pleasant and profitable session, and that each one upon returning to their respective homes will feel that they have been amply repaid for time and expenses in attending this meeting. I will not consume much of your valuable time, knowing full well the addresses and discussions to follow will be much more interesting and instructive than anything I shall have to say.

But I must ask your indulgence while I offer a few suggestions, which I do in hopes they will bring out others that will add to our usefulness as a Society and to the ultimate benefit of horticulture in our entire State. And in so doing, I do not insist upon the adoption of any one of them, but hope that you in your wisdom and better judgment will adopt and carry out only those views or ideas that bring the greatest good to the greatest number.

First, our finances need and require your careful attention, and should receive it

early in the session so that we can have ample time to attend to the matter. As most of you are aware, the decision of the attorney general in regard to our reserve fund and the setting aside of money to meet the premiums offered by the executive committee of this Society, in accordance with resolutions and instructions of this Society, and as printed in our Report for A. D. 1884, pages 256 and 257, and which all thought were in strict compliance with the law meeting our appropriation. But the attorney general differed with us in regard to our rights under the law, consequently we must bow to the power in authority. But thanks to the kindness and courtesy of state auditor Braden, after the matter was fully explained to him, I think has so arranged matters that we can easily work our way out without further difficulty. The auditor informs me there is now standing to the credit of the Minnesota State Horticultural Society the sum of one hundred dollars on appropriation for 1885, and one thousand dollars on appropriation for 1886, and available when needed to pay premiums and necessary expenses of the Society. But, as I understand them, we must in order to draw this amount first use up our reserve fund drawn from the State, and now in hands of our treasurer. And in order to do this, it will require some action by this Society to authorize the executive committee to so expend this fund. Then as I understand the matter, instead of having our reserve fund drawing interest in the hands of our treasurer, we will be obliged to keep the amount on hand in the office of State Treasurer without interest, the auditor having consented to carry the amount over to our credit instead of carrying it back into the treasury as unexpended balance, as is customary in such cases, and in that case we would only lose the interest now received on our reserve fund. I believe the affairs and finances of our Society have been prudently and as economically managed in the past year, as the welfare of the Society would permit.

Our last legislature failing to pass the appropriation to enable us to make a display and be represented officially at the last meeting of the American Pomological Society, held at Grand Rapids, Michigan, in September last, left us without representation in that honorable and useful body, with the exception of Hon. Peter M. Gideon, of the State Experimental Farm at Minnetonka, who, I understand, attended and from whom I hope to hear a report of their proceedings; and I hope at the next meeting of said society that we may be able to make a general display and gain some fine prizes for Minnesota and our Society. I would recommend the election, at this meeting of a legislative committee of five of our best and most influential members to attend to such legislation as may come up in our next legislature for the benefit of this Society, among which should be the provision for a State Entomologist and the erection at State fair grounds of suitable buildings for the purposes of exhibition of all horticultural products. Now if the State Board of Agriculture wishes and expects the Minnesota State Horticultural Society and its members to take an active part and help to make the State Fair the success it should and could be made, inasmuch as they receive all the gate money and State appropriation for premiums, they should be requested to and should set apart for the use and benefit of our Society, to be under the entire and exclusive control of the executive committee of this Society, a sufficient sum to enable them to offer liberal premiums on all horticultural products, and they should have them and the making of premium lists and awarding of premiums thereon under their exclusive charge; and such

premium lists should be made out in time to be printed in our reports as early in the season as possible, so that all could see what premiums they could compete for. I think the executive committee, composed of horticulturists, would be more capable of getting up a premium list suited to our wants, and one that would bring out a larger and better exhibit for the same amount of money, than by the course now adopted by the Board of Agriculture, and one that would give much better satisfaction to all concerned. In order to make our exhibits and Society a success, the premiums should be offered principally on single plates of fruit and single specimens of plants, or for best three or six plants of a kind, for best peck, one-half peck or dozen or one-half dozen of vegetables, and first, second, third and fourth premiums offered on all leading desirable varieties, and then a reasonable amount on a few sweepstake premiums. In offering on single plates and specimens instead of largest display, you will give all an equal chance to compete for all premiums, and in that way I think, bring out the choicest specimens from all our growers, and get up a display of real merit and worthy of the premiums offered. When the premiums are for best or largest display there is only a few of the largest growers, or those who can obtain from others what they lack to make up an assortment, that will exhibit at all, and is it not much better to have one thousand exhibitors with one or two specimens of choice fruit or plants, than to have only two or three exhibitors with a large display, many of which are only put in to make out a collection of a large number of varieties, and are worthless to grow for any other purpose.

I would also recommend a list of premiums for young ladies and gentlemen under eighteen years of age, or men that age, to induce them to make exhibits and become interested and active members of our Society. Again, instead of offering agricultural papers for all second, third and fourth premiums, amounting to one dollar or less, I would offer one year's membership to our Society and a copy of our reports. Hoping thereby to introduce them into every school district in our entire State.

Believing, as I do, that the Minnesota State Horticultural Society was organized for the benefit of the people of the State of Minnesota, and not for private purposes of any kind, whether in the interest of nurserymen, old settlers, or a mutual admiration society. You will pardon me I hope for the views herein advanced. When I look around and see the same old faces for so many years, and see them slowly passing away to other, and I hope better fields of labor, and their places supplied only by others of about the same age, I don't wonder at the question being asked, if ours is not an old settlers association? Then, again, when I hear discussed by the hour the Duchess, Wealthy, or Transcendent crab year after year. that someone should ask if some nurseryman has not an ax to grind, or are we not talking to see which can make the best speech, or for mutual admiration.

I for one feel that there are other vital and important interests in horticulture, floriculture and arboriculture that demand, and should receive, at least, a share of your attention. The cultivation of vegetables and the varieties suited to our soil and climate has been almost wholly ignored by this Society, while there are more than twenty engaged in growing vegetables and small fruits, where there is one in growing apples to any extent; and there is received and marketed in this State, at least, fifty dollars worth of vegetables and small fruits where there is one dollar's worth of apples; and still our State has this season imported many thousands of

dollars worth of vegetables, to say nothing of small fruits that could and should have been raised in our State, and the money saved to our own citizens, instead of going to other States. One town in Michigan boasts of having shipped 20,000 tons of celery, much of which has found a market in St. Paul and Minneapolis and other Minnesota towns, and this, together with car loads after car loads of other vegetables have come to Minnesota for a market that could have been grown here of better quality, and at a large profit. Now, would it not be well to get the vegetable gardeners to come in and take an interest in our Society and discuss the best varieties, mode and manner of cultivation. Again, if we would get the ladies to take a part and interest themselves in our Society, (and who is there that does not want them here) should we not take more time for discussion of different house plants, flowers and shrubbery, and the best varieties and mode of cultivating them?

Now, in regard to our Summer Meeting, instead of having a two days' meeting and exhibition, I will propose that the Society form itself into a committee of the whole and pay a visit to the State University Experimental Farm, and there take our baskets of lunch and spend the day, some time in the month of June agreed upon by the executive committee and Prof. Porter, and in this way learn more in one day than we could discussing here for a month, and all take notes of what he or she sees new or of interest, and then when we come to compare ideas at our winter meeting will have something for a common standpoint, from which to judge of different varieties and modes of cultivation, and a chance to see and learn more of new and improved varieties and modes of cultivation than in any other way, and at the same time see and know what is going on here in our midst for our special benefit.

I have thrown out these suggestions, but wish it distinctly understood that I do not insist upon the adoption of even one of them, but offer them in the hope that they may suggest to the minds of the members of this Society the importance of adopting some measures to interest and draw into our Society the young and rising generation, so that they may become active and honorable members thereof. And that the Minnesota State Horticultural Society in its usefulness may survive long after its present members have gone to their last resting place. And that we may have done something in our day to put the Society in a prosperous and progressive position, will ever be the wish and prayer of your humble servant. Thanking you each and all for the kindness and good feeling shown me, I herewith return my thanks for the honors conferred upon me, and will bespeak for my successor your best aid in carrying on the good work already begun, and may it go on without interruption until every town in this State shall have its orchard, fruit, vegetable and flower gardens, and its yards filled with evergreens and shrubbery, and its sides fenced with shade and ornamental trees, and each school house in our State its play grounds well laid out and beautifully supplied with shade and ornamental trees, shrubs and flowers, and the requirements of horticulture and plant growth taught in every school in our land. To this end let us each and all work with a will and harmoniously, and that each individual member will forget and forgive each and all their differences of interest and opinion that naturally and frequently occur in Societies of this kind, and always remember, to freely accord to others the honesty and freedom of opinion that they expect to exact for themselves.

The next on the program was the following paper:

CROSS-BREEDING OF PLANTS.

By GEO. P. PEFFER, Pewaukee, Wis.

Plant breeding has reference to crossing, or producing new varieties from seed, or originating new varieties of any species from flowering plants, or tree-fruits of any kind. New varieties are constantly and naturally produced by pollenizing our domestic fruits. This result may be secured when several sorts of the same species are in bloom at the same time.

We cannot depend upon seeds saved promiscuously to propagate a certain variety and obtain the same result secured by grafting. But if we understood how to control a variety, or species, and the proper manner of assisting nature by hand work, (if only on a limited scale) we may produce a better fruit in respect to quality, size, color or keeping merits, or all of these characteristics combined; also, at the same time promote hardiness and productiveness.

It is necessary to understand the characteristics of fruit blossoms in order to distinguish between those which are stamen and those which are pistil varieties. Both forms are found usually in the same flower, especially on fruit trees. It is necessary to cut out the stamens from the flower to be used for the female plant before the large leaves spread open. The flower should then be confined within a paper bag, or other proper covering, until other flowers, having stamens, and which have not been disturbed, are ready to burst into full bloom, when one of these should be placed in the bag, leaving but two flowers in the same bag.

If it is desired that the new variety to be obtained shall combine hardiness and thriftiness of tree, the female (or the flower from which the stamens have been removed), must be the hardier of the two trees from which the flowers are taken. If good shape or form of fruit is desired (the color will not differ greatly), the one used for the male must be taken from a tree having the qualities desired; the same may be said as to season of ripening, quality of fruit, flavor and productiveness.

As soon as the air is warm enough to open the petals, or flower leaves, the pollenizing is accomplished. By labeling the limb or spur by the name of the staminate or male variety used, there will be no room for mistake in keeping the proper record of the experiments made.

By saving seeds from fruits pollenized in the manner described and planting them, the product when fruiting will not vary materially from the two varieties used to originate the new variety.

In order to perpetuate a variety which is sometimes desirable, in order to secure hardiness of tree and preserve the identity of the species, isolation is necessary in order that the pollen from other flowers may not supply the pistils. As soon as the flowers are ready to open, in order to keep them fresh until the pollen around them is scattered, enclose a few bunches in a paper bag, allowing them to open within the bag. Keep them confined until the flowers are fully developed before removing the covering. In this way the variety may be perpetuated by preserving the seed from trees treated in the manner indicated.

Had this system of perpetuating hardy varieties been extensively practiced since these Northwestern states were first settled, and varieties propagated from, which

had proven specially hardy in certain localities, we would not now be required to send to Russia to obtain hardy varieties. And it is my opinion that we will have to resort to this practice yet if we want to raise fruit of good quality.

Much credit is due to Prof. J. L. Budd for his efforts in introducing the new Russian varieties of the different fruits; for the accounts of his visits to the fruit growing districts of Northern Europe, (in company with my friend from Canada, Mr. Chas. Gibb); for his description of the varieties of fruits found, the character of the climate, the distances between certain varieties, where found, etc. From the descriptions he has given I take it for granted that the countries visited were older than ours. From these investigations and from personal examination of the Russian varieties with which I am familiar, that have been propagated here, I conclude that *all* of these more valuable Russian varieties were produced from seeds; that the best varieties are from natural crosses; that the progress made thus far is due in part to gradual acclimation, and advancement to more northern districts.

It should be observed that very few varieties of special value were found in large districts of country; that the farther north we go the fewer are the varieties found having any merit. It is true Prof. Budd refers to latitudes and situations much colder than ours. Many of the varieties found in such localities will no doubt prove to be hardy enough in our climate. In fact many sorts have already proven to be so, since they came through all right the last test winter.

We have personally tested some thirty-nine varieties of Russians which were fruited in Wisconsin, also made outlines of some of the best, noted the time when ripe, quality, etc., etc.; but we failed, however, to find a single variety in the list that was equal in quality to the Wealthy, except, perhaps, the Longfield. It may be as good an apple but is not as long a keeper, and in my estimation is no hardier, grown side by side with the Wealthy, as I have seen both varieties badly damaged.

There is no doubt that many of the new Russian varieties will prove a blessing where other varieties can not be grown successfully, or where nothing but the Siberian crabs can be grown. But there is a limit to all things, and many who are trying to grow these varieties will be disappointed.

Prof. Budd undertakes to predict that wherever melons and Indian corn can be grown successfully, becoming fully ripe, either east or west, that most of the hardier Russian varieties can be grown; not only of the apple, but also of the pear, cherry and plum. In his estimation they are all the time improving, especially those varieties which originated in that part of the country where dent corn and melons have ripened. I am in hopes the Professor is right; it certainly would save much time. But if he is not, then the surest and best way to proceed would be by the production of new seedling varieties.

It has been demonstrated very conclusively to my mind that nearly all the Russian varieties are crosses originated in localities where varieties have been kept separate by local causes, which is, no doubt, the occasion of the distinctions which exist between many of these varieties. It also appears that all the improvements made have been from natural pollenization and by reproduction from the seed.

It has required the process of many years of continuous cultivation and propagation to produce such fruits as they now possess and enjoy. The Russian people

deem them to be excellent varieties; so also would we if we had never tasted anything better.

By means of cross-breeding we can improve even the best known varieties of our fruits. To accomplish this result it is only necessary to use our best sorts for the male parent.*

DISCUSSION.

Mr. Smith. Mr. Peffer takes the ground that the quality of Russian fruits is of a much lower standard than of our best American seedlings, and that while we may perhaps gain something by the general production and planting of Russian fruits, the apples of the future for the Northwest must be produced from American seedlings, and not from the propagation of these Russian varieties.

Mr. Harris. I would like to hear from Mr. Sias on that question.

Mr. Sias. My opinion is that we have no better fruits and better quality of apples in the State than we find among those same Russian varieties. You may take, for instance, the White Transparent; I don't know whether I have ever fruited anything that surpasses that in quality; the Russian Green is hard to beat. I have several other varieties of very fine quality. I have not seen any native seedling varieties that surpass them; there may be some in the Northwest somewhere, but if so, I have not seen them.

Mr. Tuttle. It is a little singular that Mr. Peffer should take that position at this late day. There was a time when that was the general cry. I don't know where, and I would like to be informed where the American seedlings are that have been originated in the Northwest that would compare in quality with those of the Russians. We have to fill the place of all those old varieties that we have heretofore been depending upon. And we have Russian apples to fill their place, as market apples, as to quality and as to productiveness. I defy any man to take the same number of American seedlings and compare with the Russians in these respects. If anything, I should say that the Russian apples are the better apples; they are better in quality. We have a large number of those apples of different qualities; for instance, there is the White Transparent, an early apple. That has been fruited more generally and is better known, both east and west, and it stands to-day ahead of any early apple grown east or west. I would like Mr. Peffer to mention an apple that would compare with

*Mr. Peffer states in a private note that he has only briefly referred to cross-fertilization in this paper, since the process is more minutely described in some of the earlier volumes of the transactions of the Society.—SECRETARY.

the Transparent. It is equal to the Early Harvest; it is larger, finer, and always perfect in form and handsomer in appearance, and is considered by eastern consumers as being ahead of any apple in the east. Consumers in New Jersey place it ahead of any apple in the east. Then coming after the Transparent we have other apples, which take the place of the Early Joe and Strawberry apple; the Green Streaked apple, a large apple of the Alexander type and better in quality. I might go through the whole list. There is the White Russet; that will take the place of our old variety. It is an apple that for bearing and beauty, and in the market will fully take the place of the other. I can go through the list, and mention apples which will take the place of those that have failed. It is too late in the day for a man to come out and talk about there being no Russian apples of good quality, or that there are no Russian apples that will keep. We always considered Mr. Peffer's opinion as of a good deal of value, and I am a little surprised that he should take that stand. I have exhibited to Mr. Peffer some of my Russian apples, knowing that he had been opposed to the Russians; I wanted him to see and examine for himself. He made that examination and expressed himself as believing that the Russian apples were the apples of the future.

I trust I have no interest in this matter, beyond the interest of this great Northwest; of course we are growing them. I have been to work at those apples for the last fifteen or twenty years. I have believed (after I heard what there was in Russia, 500 miles beyond Moscow, in a climate more rigorous than Dakota, where they have the most extensive orchards in the world) that from there was to come our fruits for the whole Northwest. We have for forty years been trying to propagate seedlings, and what have we got. We haven't produced a seedling that will compare with the Duchess of Oldenburg. And we may go on, and we will go on for years, and after going on for 500 years, I doubt if we will get where Russia stands now. They have a class of fruit such as we cannot grow of American varieties; they have the apple, the pear and the cherry. And I have no doubt that when we have introduced their hardy fruits, that Minnesota will become as good an apple growing State as Michigan or Ohio.

Mr. Sias. In regard to the Transparents. I came to Minnesota from Western New York. I believe that is considered a good fruit growing country. I think the Early Harvest was considered one of best early varieties they had. And yet they are very much surpassed by some four or five varieties of these so-called Transparents. I can-

not see why they are not equal to any of our American apples. I agree fully with Mr. Tuttle in that respect. I know of nothing better. I think they are sufficiently hardy for my location. I have fruited the Red Transparents and the Green. I have never fruited the Yellow which he has spoken of particularly, but it is cultivated in other places and I have seen them. I know it is one of the best. But there isn't very much difference between that and several other members of the family. The earliest apple that I have raised is the Early Champion. It is a very fine apple too. It is not quite as good in quality as the Red and Green Transparents.

Mr. Smith. Peffer says that he tested thirty-nine varieties of Russian apples as to length of time in ripening, quality, hardness, etc.; none came up to the Wealthy except the Longfield.

Mr. Tuttle. I think Mr. Peffer is mistaken. The Wealthy is the only American apple that we are propagating. We have found among the Russians varieties that are hardier. The Longfield is hardier than the Wealthy. I had a tree that bore an enormous crop a year ago last fall; I am confident if it had been a Wealthy tree it would have been dead in the spring, but that tree is now in good fair condition.

Mr. Cutler. I have understood that the Yellow Transparent was not a safe tree to plant beyond a certain limit. I would like to inquire if any of our nurserymen living in this vicinity have tried it?

Mr. Pearce. Mr. President, permit me to say a few words on this subject. They seem to be a little hard on our friend Peffer. A few years ago Thomas Moulton, introduced a good many of the Russian trees of many of the varieties prominently known, such as the Transparent; there were, I believe, thousands of those trees sold in this vicinity. Gentlemen, I will give you \$5 for every one of those trees that you can find alive to-day. They grew and bore fruit, but there is not one of those trees he sold here but what is dead. It has proved that they don't begin with the Wealthy in this section of the country. We have tried them twelve or fourteen years ago. Now, there is the Transparent, probably it is as hardy as any; it appears to be hardy. But the fact is, these trees are not where they belong; they belong further north than here—entirely so. These trees live through the winter, the warm weather comes on, the buds appear, and after that they die. It is not because they are not hardy; they are as hardy as any tree, but it is something else. They are out of their latitude; they belong further north. You put them on high hills and knolls and they do reasonably well. Take the Transparents every last

one of them—large trees that were eight or nine years old—have died. Now, this is a fact that is well known among fruit men in this section of country.

Mr. Tuttle. Were those Transparents that died?

Mr. Pearce. No, but they have failed.

Mr. Sias. I have not had very much experience with the Yellow Transparent. I have some of the White which I set out a year ago last fall; the White seems to be very nearly the same thing as the Yellow. They are all alive to-day. Of course, that isn't time enough to test it. But last winter we considered the hardest winter we have seen since we have been in the country, and we must conclude that they are tolerably hardy; right opposite them we had the Wealthy, and nearly all of them were killed.

Mr. Pearce. Mr. Sias has high ground, and very well adapted for those Russian trees. Now, you can take certain localities for the Transparent and it is all right, but you must select a locality that is not subject to those sudden changes that do the damage.

Mr. Tuttle. I would say that I don't consider the Transparent as hardy as a good many other kinds, but it has stood a good deal better with me than the Wealthy, and it is hardy enough, I think, for our State. And so far as my orchard trees were concerned or nursery trees I never saw anything that showed tenderness. I had several hundred Russian trees in the nursery, and several hundred in the orchard last winter, and every one came through in good condition. I have had no reason to doubt their perfect hardiness. I have not the least doubt but that they will compare with anything we have been in the habit of growing, take them as a class.

Mr. Latham. I visited the orchard of Mr. Gould a year ago last summer; I found quite a number of trees broken down more or less, and on those there was scarcely any fruit. I asked Mr. Gould what was the cause of that; he said those were nice apples and the boys came out there from the city and broke down the trees in getting the apples. I judged they were not in the best condition to show the merits of fruit. The varieties of the Russian that I have seen, on my own place and elsewhere, have done well, and some that I have are hardier than the Wealthy. I will not say as much for their quality. I examined an orchard with Mr. Gould when Early Harvest apples were ripe, and we made a thorough search through that orchard; we didn't just run through it. I think we went to every tree. The man that lived on the place went with us, and I think he took us to

every tree that had been grafted or borne apples of a Russian variety, and quite a number of those trees were in bearing, and some of them had been broken down or limbs broken off, I think on the Transparents mostly. Some of the limbs were quite large when they were grafted, and they broke off easily. We found quite a number of them in bearing but the most of them were poor in quality. We found one or more that were nice, smooth apples, of fine flavor, and one tree that the man pointed out that had been bearing, he couldn't remember the name, but those he said the boys had destroyed, I think there was only one branch left, and we could see where the others were broken down.

Mr. Stubbs. I am quite interested in this subject of Russian fruits. I would like to know if there is a history of the pomology of Russia, that is of how they started their fruits in that cold country. Did they have to battle with the elements, or import their stock from Asia? I claim, if they could fight the elements of nature for a hundred years and produce such wonderful fruit, as has been admitted they do, where it is certainly colder than it is here, I see no reason why we should be discouraged because we have not achieved full success in thirty or forty years. Perhaps they worked for one hundred years. I believe, gentlemen, that our fruits which we will get here in the future will come from our seedlings, and I still sincerely hope that these seedlings will abundantly repay those gentleman who have worked so assiduously and untiringly in the propagation of American seedlings. I would like to know the history of fruits in Russia, how they brought them up to the standard of their present excellence.

Mr. Somerville. Mr. President, I have been trying to raise a few Russian apples for a number of years. I got trees of Mr. Sias of Rochester. I set them out, and I will say that I have had more fruit from those trees than I have ever had from all the seedlings from that time to the present, and I have tried almost everything that I supposed was hardy. I think it would be useless for us to wait at this time to raise seedlings when we have got Russian varieties that are adapted to our soil and climate. I set out an orchard some fourteen years ago of about eight hundred trees. I selected the best seedlings to be found in the country, the best that I could hear of, the Wealthy along with the rest. I also now have about forty-seven Russian varieties. I am not a nurseryman, and will not undertake to tell the names of those Russian varieties. Last winter killed pretty near the last of the trees in my orchard, except my Russians. Of them I think I haven't one that

was injured. I think I have something over twenty varieties in bearing, and there are some there that are excellent fruit, and there are others of them again that are far from being valuable. The majority of them I consider good keeping and good cooking apples. I think the only way we can succeed at fruit raising is to get these Russian varieties and make selections, and thus take advantage of their five-hundred years' experience, and by doing that we will get our fruit right away, at the start. That is my opinion. Now, of my Wealthy, which we consider stands at the head of our seedlings, everything was killed or injured. And so I think we can get the fruit quicker through the Russian varieties than we can in our own seedling system.

Mr. Sias. I am aware, as Mr. Pepper says, that the Russians have the reputation of being poor in quality, and it just occurred to me what the reason might be. There is always a reason of course, for everything. Among the earlier varieties sent me out of the Moulton orchard was a Russian. Those apples commenced bearing very early, and there has probably been more of those raised in this State than in all the rest together, perhaps. They are of a very poor quality of fruit, they are coarse grained, bitter fruit, and I can't think of any better reason than that for the reputation that Russian apples have got for quality.

Mr. Harris. When our pioneers came to Minnesota, they first had to content themselves with a hole in a clay bank or a log cabin, but afterwards they came to live in palaces, and we now experience none of the hardships of the early settlers. And so, it would be unwise in us to neglect such a great boon that is coming to us in the Russian fruits. We are told that they were more than five hundred years in getting the apple up from China before they would produce fruit in Russia. I believe that our seedlings can be brought up I believe that replanting and continued replanting will produce that hardiness which the Russian apples have attained at home, and bring them up to the standard which we desire to reach; if we understood the physiology of vegetables and fruits, perfectly, that we could raise our own seedlings to the standard that the Russians have in theirs. I don't expect that these Russians that are being brought here, or any large portion of them, will prove what the American taste will demand. I have no doubt that the majority of them will prove hardy and thrifty, when they are planted in the right place. There are some varieties that may stand upon the most arid and cold points; there are probably other varieties that would not stand that rigorous treatment, but

would come to perfection in the valleys and prove to be our choicest apples; and there are others the taste of which is so bitter that we couldn't hardly get our pigs to eat them. Perhaps those will grow upon the most arid of our hills. It would be useless to raise great quantities of these Russian apples that are almost worthless, but I have a good opinion of some of them. I believe we ought to avail ourselves of these Russian fruits, but ought to move a little slow, and when we purchase, instead of buying at Rochester, N. Y., and from Ohio nurseries claiming to have the new varieties, that we should try to get them from nurserymen that we know have them. Mr. Wilson, of Iowa, has some; Mr. Gibb brought some into Canada. We know Mr. Tuttle has them. But we don't know that we get a "Siberian crab" from the nurseries of southern Illinois and Ohio. Their agents are bringing up to Minnesota trees that they tell us are "new Russians," "the best thing ever was," and are selling them at a dollar apiece, when they probably bought them at home for ten cents apiece. I hope the farmers will try and get some of the very best of these Russians, and that they will, when they have planted them and grown fruit, raise seedlings from these, and from these seedlings take the best and raise seedlings again, and if we continue doing that we will turn the Russians into full-blooded Minnesotians. We will adopt their fruits as we have their citizens, (for there is none of us but what have come from a foreign race) and in that way I am confident that we shall produce the best fruit that can be grown. We have the elements in our soil and atmosphere to perfect the fruit; we will take their hardiness in the tree and we can get the American flavor into it in time.

Mr. Tuttle. I wish to say just a single word. It seems that there is a sort of a universal sentiment, but a wrong one, that the Russian apples are all poor. I can mention varieties among them that will rank with our best American apples. Take the Anisettes, the Fameuse, the Golden White and others; they are good in quality. I never expected at first that we could get half a dozen, or as many as ten varieties that would fill the bill, but we have got them. I don't claim that all these Russian apples are of first quality, but I do claim, that take them together, they are of good quality.

The following paper was then read:

THE "BLEEDING" OF APPLE TREES.

By T. H. HOSKINS, M. D., Newport, Vt.

A recent writer says he has trimmed apple trees every month in the year, and has come to the conclusion that from May 25th to June 25th is the best time, because a wound made in the full flow of the sap will begin to heal immediately. He adds that March and April are the two poorest months to prune, because there will be a liquid "forming" (query, flowing?) out of the wound, which will kill the bark underneath the limb. Another writer insists that March is the best of all months to prune, because the sap is not then in motion, and the wound will dry before the sap starts, and that then the process of healing will go on most favorably, while anything but very light pruning in June will greatly weaken and sometimes kill the trees. Still another writer says, shortly and emphatically, "Prune when your knife is sharp," without regard to season. All these writers are orchardists of experience. Is there, then, no proper time to prune, or no way of intelligently reconciling the seemingly contradictory views of these practical men?

WHY APPLE TREES BLEED.

A widening accumulation of facts does, in all disputed questions, tend towards the reconciliation of conflicting opinions. In the thirteen years that I lived in Kentucky I never saw an apple tree "bleed," that is to say, I never saw a flow of disorganized and blackening sap from the stump of a severed limb. In the first years of my orcharding in Northern Vermont, this so called bleeding exhibited itself in nearly every case where a limb of any size was removed, no matter at what season the operation was performed. It was the most discouraging of my experiences at that time, and I could not understand it, or find a remedy for it.

About fifteen years ago, at a session of our State Board of Agriculture in the Champlain Valley, where this question of pruning and subsequent bleeding was discussed by many orchardists of that orchard country, one of the speakers dropped the casual remark that he had never known an apple tree that was not "black-hearted" to bleed, no matter at what season it was pruned. That thought was much more fruitful to me than my orchard had been up to that time, for all my trees were black-hearted, except the Siberians and Russians, which I at once remembered never bled, no matter when they were pruned. And at the same time I remembered that apple trees are never black-hearted in Kentucky.

THE CAUSE OF BLACK-HEARTEDNESS.

The state of black-heartedness in the apple tree is unquestionably the result of excessive winter's cold. In New England a large proportion of the most popular apples are grown upon trees that are more or less black hearted. The Baldwin is always black-hearted in Maine, New Hampshire and Vermont, and frequently so in the three southern New England States. Along its northern limit it can only be grown when top-grafted on some hardier stock. With me a Baldwin tree or graft has never lived long enough to bear an apple.

Now, if it be true that only black-hearted trees bleed, then the experience of orchardists must vary according to whether they are growing more tender or more hardy sorts. When I began, though I planted the hardiest known of New England

sorts, yet almost all my trees became black-hearted in a few years. Now that nearly all of that class of trees have been up-rooted from my orchard, and re-placed by the "iron-clads," I see almost no bleeding, and when I do see it I know the cause. I do grow a few sorts that suffer some in this way, (such as Fameuse,) because of the excellence of their fruit. The Fameuse is with me as hardy as the Baldwin in the upper Champlain Valley, and though the trees are short lived in both cases, they are planted because of the merits of the fruit.

WHEN TO PRUNE.

In my experience it makes no difference at what season a black-hearted tree is pruned, as regards the subsequent flow of disorganized sap, provided the limb severed is so large that the stump will not quite or nearly heal over in one season. This flow takes place during the whole growing season, and injures (often kills) the bark over which it runs. A tender tree, subject to black-heart, should be pruned very sparingly. Branches not too large to heal over in one season may be taken off, and the best time to do this is in June, as the sap is then too thick to flow freely. But heavy pruning in June is a severe shock to the tree, even to the hardest kinds, and almost surely fatal to any tender sort. Fall and winter pruning is also injurious to tender sorts, as the bark around the wound will be killed for some distance, and there is little hope that it will ever afterwards heal. But any of the varieties that never become black-hearted may be pruned "whenever your knife is sharp," remembering this, that June pruning is a shock more or less severe, according to the amount of wood removed. "Prune in summer for fruit," is an old and correct rule, for the very reason that the shock of summer pruning (like anything that weakens the tree) tends to cause the formation of fruit buds. The effect is much like that of root pruning, and both must be practised with moderation and judgment.

DISCUSSION.

Mr. Sias. Mr. President, I fully agree with Dr. Hoskins in regard to pruning trees. I am well acquainted with his location; it is almost precisely on this latitude. He is a man thoroughly posted, and I think if we follow his directions and suggestions in regard to pruning, we will find them all right and applicable to this latitude.

Mr. Gould. He says if they are trimmed in that way only the black-hearted limbs will bleed; it seems to me that isn't just right. It seems to me that the other limbs do bleed sometimes.

Mr. Harris. I think he leaves the bars down there.

Mr. Gould. I have discovered that the trees don't bleed if pruned in the latter part of March, or first of April, before the sap starts at all. And there is another time in August,—I am speaking of the time I consider it safe—after the growth is made and the hardening process is taking place, the tree is not then growing so much in diameter. If they are pruned when this extension growth has ceased they don't bleed, and I have practised pruning at that time more or less. Where

you prune in August they will heal over that same fall. It is not safe to prune late in the fall, or just before the winter. The cold seems to penetrate at these points, and the result is that the wood will die around those wounds and the sap will begin to run through, and the insects will come in there or the worm and injure and destroy the tree.

Mr. Latham. Mr. President, I have never tried pruning until recently. I made up my mind that I would prune my nursery stock in the spring and so I went out when the top of the ground was frozen, and pruned them with a sharp knife, so as to leave no scar or spot that would not be covered with the growing bark. I made it a rule to trim my orchard at the same time, although I have found it is safe to cut a small branch at any time, if cut close to the tree. But in pruning orchard trees, it is better to prune them in the spring before the sap starts. The wood then dries over. If the wound is larger than a ten-cent piece, I have always made it a practice to cover the wound with some kind of salve, and I don't know as I have ever seen a bad place on a tree from pruning, treated in that way.

Mr. Pearce. I have observed that my graft cions sometimes rot at the end. I graft a good deal. My cions are cut in the fall; I pack them in saw-dust; I graft them in the spring of the year. I take a healthy cion, and it is sound clear to the end; I take another apparently healthy cion and find it rotten one-third of the way out, while the other is perfectly sound. Every man that has used grafts has found that to be true, and I would like to ask if anyone can tell why it is?

Mr. Gaylord. I have been experimenting some with apple trees for a great many years on a small scale, and I will tell you that our Iowa folks have come to the conclusion, the leading men all through our state have come to the conclusion, that the best time to trim trees is when the leaves begin to open, when they are as large as a ten-cent piece. We have a man down in Iowa who declared that winter was the best time to trim trees. He went out and trimmed a number when the thermometer was twenty degrees below, and one of those trees bled all summer long.

I am well convinced that a knife should be used very little in this Northwestern country. We never should graft a limb larger than my thumb, and only a little at a time. Three or four grafts are sufficient to commence with.

Mr. Sias. I am still of the opinion that the Doctor is right. If your trees are perfectly hardy, as he says, you can trim any time—any season of the year. I also have trimmed considerable in September, and I never have seen any bad results in pruning at that time.

Mr. Harris. I bought some of the trees that Mr. Sias pruned in September, and they dried up so as not to show any particular injury to them, but I like to trim when the leaf is full size, by taking the branches off that are not more than a quarter of an inch in diameter. Large branches are better taken off some other season of the year. I have done it as late as October, and I have seen no bad effects from trimming at that time. I never saw a black-hearted tree but what would bleed. About cutting the cions; I know that Mr. Pearce's experience has been that of others. I have had them rot when others would not, put up in the same box, in the same condition; they will rot a piece from the end. Why it is or what, I cannot tell.

Mr. Smith. If you cut them when they are frozen they will rot some distance; usually, I think, from one-sixteenth to half an inch.

Mr. Pearce. There are facts with reference to trees rotting or drying up that are well known to old settlers. I lived in a country where they sometimes wanted to clear ten or twelve acres of timber in a season, where we used to rot it and burn it. If they wanted to saw the timber they took a certain time in the summer to girdle and cut it. If they wanted a tree to rot right out they always girdled in the winter. If girdled in the summer time the tree will always dry up, and it will stand there for years; you may cut them down a year afterwards and saw them up; but the same trees if girdled when there is no sap in them will tumble down in three years. There is that difference in the condition of trees growing and when they are not growing, and there is something about it that we don't exactly understand.

Mr. Smith. Mr. Pearce, haven't you made a mistake and just reversed the thing? If you girdle your elms and basswoods in the winter, any time from December to March, the stump will throw up suckers. Timber cut in June isn't supposed to be valuable for any purpose. I guess you have just reversed your theory.

Mr. Tuttle. I have seen that done in white oak. White oak cut in February will rot, but I noticed the same kind of timber that was cut in August two years ago, and a short time since. I saw that the leaves were still hanging to the branches and twigs, and the timber did not rot at all.

Mr. Cutler. I think Mr. Pearce is correct. The tree cut in August has an immense absorbing surface; there is not a large amount of sap coming from the roots at that time, and when the tree is girdled what is left in the tree is very speedily absorbed, and the tree is much more rapidly dried. If cut in the winter, the reverse is true; the sap is in

the tree, it has to dry out through the bark; and the wood will rot before it will dry. There is no doubt but that trees cut during the month of August will make much more durable posts than if cut at any other time in the year.

Mr. Whipple. We are at the cooper business, and I know from experience in that that there is only one month in the twelve when it is safe to cut hickory whip-poles and have them last when they are put on the barrel, and that is in the dead of winter. Then they never powder-post.

Mr. Pearce. I think that is explained by the fact that in the dead of winter there is no sugar in the trees. When the sap starts it forms a starch or sugar, and the worm works in the wood for that. There is a time in the winter when this starch or sap is chrystalized, and there is no sugar about it.

Mr. Sias. Several years ago I saw, about a hundred apples trees girdled, I think some time in June; there were trees probably six to eight inches in diameter, and a foot or more of bark was stripped off clear around. It was done to make them bear early. They were Baldwins and they usually bear very late. I saw the orchard some years afterwards and I noticed that it dwarfed the trees, but they came into bearing several years sooner. I was talking with the proprietor of the orchard about it and he seemed to think it paid.

Mr. Pearce. There is a time about the 20th of June, when if you strip the bark clean off, from the ground up, in twenty-four hours there will be an entirely new bark. At that time the sap is just like glue. It is perfectly safe and is frequently practised in Ohio.

Mr. Sias. I don't know as that is dangerous, but my impression is that it would kill my trees. My grounds are high and my trees require a moist atmosphere. Here it is so much drier that I believe girdling would kill the tree.

Mr. Cutler. I would move as the sense of this Society that the best and safest time to prune is before the sap starts in the spring, after the cold weather of winter is past.

Mr. Kellogg. I would suggest that there is quite a different opinion as to when the sap starts. Pruning, I think, should be done pretty early in the spring; it is better not to let it be too late; the sap starts before the frost is out.

The motion was adopted.

Mr. Gaylord said he wished to find out in some way the youngest man in the house, as he had a curiosity to know how many young men were interested in horticulture.

Mr. H. F. Latham arose and stated that he was twenty-six.

Mr. Cutler said there would be quite a number of younger members present the last day or two of the session.

The meeting then adjourned until Wednesday morning, at nine o'clock.

MORNING SESSION.

SECOND DAY, WEDNESDAY, JAN. 20, 1886.

The meeting was called to order Wednesday morning at nine o'clock by President Smith.

COMMUNICATIONS.

The following letter from Vice President Dartt was read and ordered placed on file for publication:

“OWATONNA, MINN., Jan. 11, 1886.

Dear Sir: Your letter of recent date and premium list received. You may be sorry to learn that I am down flat with what is or seems about equal to a broken leg. I knocked my stiff knee joint loose last Tuesday. I think it is doing well but it is an unpleasant thing to get along with, and I write with the reserved right to be cross, as usual. You say you want a program more than full and a report equal (in size I suppose) to Iowa. A very full program means much hurry and poor work, nothing well done. A big book filled largely by professors and writers on grapes and such, will make the common reader imitate a certain old hen. She was walking in green pastures; she spied something that looked quite inviting; it was round, rather plump, and though it had a greenish cast it looked to her good enough to eat; she tackled it, scratched much, picked very little, finally with a very dissatisfied air went her way. Better have a small, good book that will be thoroughly read than a big one to be scratched over. I am much surprised that your premium list puts the best winter apple on a level with one-half peck turnips and leaves Hybrids and crab apples entirely out.

I have saved some of my Hybrids till now, expecting to exhibit if they kept long enough. I don't suppose anyone would object to their being shown, but few are found who like to exhibit their goods or themselves when they know beforehand they are not appreciated.

You may say to the old members that it would afford me a great pleasure to meet them but I am unable, and as I have not reformed, I congratulate them on being rid of me without paying my expenses to Iowa. Next year they can be on the look out.

Inclosed find membership fee \$1 00. I am under great obligations to you for your kindness and consideration. Hope you will pardon me for my old hen foolishness,

for cripples and fools have a right to fraternize or change from one to the other and claim immunities that do not belong to others. I send a short piece on "Preparing the Orchard for Winter" which you may smuggle into your book if needed to fill up.

Yours Very Truly,

E. H. S. DARTT."

PREPARING THE ORCHARD FOR WINTER.

We have found by oft repeated trials that orchard trees that have been kept in a good growing condition by cultivation and the application of manure as a mulch, each fall or early winter, will withstand the effects of extreme cold much better than those in grass or cultivation where little manure has been applied. The bearing of a heavy crop of apples so exhausts the vitality of a tree that it is illy-prepared for the test of a severe winter. On a poorish soil death is quite likely to follow a very heavy crop. On rich soil more wood buds are produced, rendering the crop less excessive. In extreme cases the thinning out of fruit or fruit branches in the early part of the season will prove beneficial.

Winter-killed trees are often supposed to have died from the effects of blight, because they frequently start in spring, make a feeble, sickly growth, linger for an indefinite time, possibly for a year or two, and then wither and die.

Blight effects trees in a somewhat similar manner, but usually attacks the thrifty terminal shoots during the growing season, and frequently leaves the trunk and main branches uninjured.

We must distinguish between winter-killing and blight; for whilst with Duchess, Tetofsky and other similar kinds manure must be applied liberally to keep up vitality, blighting kinds, like Transcendent and some other rampant growers, might be ruined by it, for excess of manure certainly favors if it does not produce blight. It is best not to plant blighting kinds, but if we have them we should seed down and mulch if at all with old hay, straw or other material not rich in manurial properties.

E. H. S. DARTT.

Mr. Grimes moved that the Society extend to Mr. Dartt its sympathy in his present affliction, but for which he would have been present at the meeting. Adopted.

The following letter was then read:

DENVER, COL., Nov. 16, 1885.

S. D. Hillman, Secretary, etc.

MY DEAR SIR: Yours of 12th at hand. Yes, we will prepare and send a paper on the "Coniferous Trees of the Rocky Mountains, their Value and Adaptation to the Prairies of the Great Northwest." In our opinion there is no profession or occupation in the catalogue of busy, progressive life more refining in its influence or elevating to humanity than that branch of horticulture covered by the propagation and cultivation of trees, fruits and flowers.

We love the plainsman of the Great West, who has caused a tree to grow where

none ever grew before. We honor that brave syndicate of brain and muscle who refuse to be "snowed under," but who through vim, vigor and victory are making Minnesota and Dakota the Agricultural Bank of America, from which we draw our daily bread.

Hoping your meeting will be one of great benefit to your State, I remain,

Truly yours,

D. S. GRIMES.

The report of the Committee on Seedlings was called for and J. S. Harris, of La Crescent, presented the following:

REPORT OF SEEDLING COMMITTEE.

FOR THE YEAR 1885.

January 1st 1886.

Mr. President and Members of the Minnesota State Horticultural Society:

I consider the encouragement of the growing of New Seedling fruits the most important question that has or will for some time come up for the consideration of this Society. It is admitted by every one who has had any experience or observation in orcharding in Minnesota that the varieties of apples at present under cultivation do not fill the bill. For more than thirty years we have been striving to grow choice fruits by purchasing and planting varieties that originated in the eastern and middle states—and whether the trees have been procured direct from eastern nurseries or from home nurseries, have found them wholly unfitted to endure our climate for any great length of time, and to-day we dare not recommend for general planting any of them or any other varieties except the Duchess of Oldenburg, Tetofsky, a few other varieties from Russia, some of the best Siberians and their seedlings, and our own seedling, Gideon's Wealthy. Among the newer Russians that are being introduced there are most likely some that will prove hardy and will produce valuable fruit, but we can hardly expect them to come up to the American standard of excellence, or to prove perfectly adapted to growing in all situations and localities, and we shall earnestly settle down upon varieties to the manner born, seedlings of these, and the best of our others that will be originated upon our own soil from seeds produced here.

As the people of foreign countries do not become fully American by being transferred to this country (although they become valuable citizens) until the second or third generation, so it will probably be with the foreign fruits. High cultivation, careful selection, cross-fertilization and successive planting of the best has been the method by which the greatest success has been attained in the amelioration and improvement of all domestic fruits, vegetables and grains. When we go back and study the history of pomology we find that a most wonderful progress has taken place in the improvement of the varieties of apples (*Pyrus Malus*) that are grown in America, and that it has all been wrought through the growing of seedlings, and that largely without the aid of any skill. A greater degree of skill has been brought into requisition in handling the grape, and the result is that from the sour, foxy wild grape we have the Concord, Worden, Niagara, Duchess, Empire State, and scores of others that suit the American taste and are adapted for cultivation over a

greater part of this country; and a similar improvement is visible in strawberries and other fruits through the impetus that has been given to the raising of new seedlings. These results encourage me in the hope and expectation that we will yet have a list of apples that will enable us to compete with any part of the world, and I see no reason why the horticulturist may not indulge his fancy with the belief that his ideal of excellence will be reached, and Minnesota will soon stand forth first and foremost among the apple growing states.

With the apple in the past there has been but little scientific manipulation, or any great amount of skill applied in the selection of varieties to be used as parents, and yet ninety-nine out of every hundred of the favorite varieties of the country have been originated from seed within a hundred years, and propagated from seed saved and planted without any specific object in view except to get trees and fruit; and therefore we have no data to prove why whole orchards of seedlings are found that are either worthless or defective in some essential points. While we occasionally find some small collections of considerable merit, to me it appears evident that seed selected from young trees that are healthy and under a high state of cultivation, and where they are likely to have been fertilized by other sorts, having desirable qualities in hardiness or long keeping, there will be a stronger tendency to sport into varieties of marked character that will make a radical improvement over planting seeds promiscuously and with no end in view.

I have in previous years made reports to you upon Minnesota seedling apples that have come under my notice, and feel confident that we are making some progress. The winter of 1884-5 was probably the most disastrous to our trees of any one that has occurred since the first settlement of our State, and several varieties of promise have gone to the wall, together with almost everything that was considered "iron-clad." This fact should renew our zeal in making a pomology of our own by the originating of new seedlings. As soon as the season was far enough advanced to enable me to determine the actual condition of the several seedlings that were coming into notice I commenced making observations, through inquiries of the parties owning such trees as had given promise of value, and by personally visiting and examining as many of them as I could without incurring too great expense and inconvenience to myself. I find that nearly all of the oldest trees that were fruitful and good enough to make them desirable are severely injured, and some that were from twenty-five to thirty years old, and that had before shown no signs of injury, were killed to the ground.

A tree upon the George Hartman farm in the town of Hokah is in good condition and produced a full crop of fruit, so say parties who have seen it at times during the season. The fruit is rather below medium in size, of very fine appearance, good for cooking, and a long keeper. Of something over twenty varieties upon the farm of Jacob Kline, town of Union, Hokah P. O., there remain two varieties that did not when I visited them June first show any more injury and even less discoloration than the Duchess in the same neighborhood, and appear very much better than the Wealthy. I have not seen the trees since that date but Mr. Kline informs me that they continue to look promising and that they produce fruit of superior quality. The Eberhard seedling of Mound Prairie was seriously discolored and was late in putting out in the spring but has improved during the summer and the owner informing me that he has hopes of its recovery. I estimate its hardiness.

to be about the same as Plum Cider. Mr. Kramer's seedlings that had come to fruiting were all quite seriously hurt but he has a number of younger trees that look very promising. The trees of Mr. Wright and others at Minnesota City were generally totally killed, several of them had survived thirty-two Minnesota winters and borne paying crops of fruit. Hearing that the Brett seedlings of Dover Centre fruited last season and that the fruit had been placed on exhibition at the Southern Minnesota Fair, and that the trees were in a promising condition, and believing that they would if sufficiently hardy prove a valuable addition to our lists for Southeastern Minnesota, I in company with A. W. Sias of Rochester, gave them a visit and examination about the first of November. We found three varieties of them that had stood as well as any Duchess in the vicinity, and one of them had cleaner wood than anything I found in Olmsted County. In addition to producing a crop of fruit they had made a vigorous wood growth and the cions of the year were from one to two and one-half feet in length. They stand upon ground sloping gently to the south.

A few varieties upon my own place that are of uncertain origin have stood very well but I do not anticipate that any of them will furnish the coming apple. The choicest variety I had, had been raised from seeds of tender varieties but while some of them were unmistakably better than their parents, all are ruined past recovery. I am informed that friend Gideon is meeting with encouraging success in the originating of seedlings, but I have not had an opportunity to examine them in tree or fruit, and therefore cannot report upon them. It is my opinion that we should make the growing of seedlings a speciality and by every means at our hand encourage the people of this State to assist us in originating that much desired long keeping apple, by saving and planting seeds from the hardiest and best fruit that is produced at home or in the Northwest, whether of American or Russian varieties. Also that we should give more attention to the cultivation and improvement of our native plums and other wild fruits.

Your obedient servant,

JOHN S. HARRIS.

DISCUSSION.

Col. Stevens. Do I understand that as the report of the whole State, or only the southern portion?

Mr. Harris. It includes all the seedlings I have been able to get any track of. At the last annual meeting, on account of the shortage in the funds, the Executive Committee proposed to abandon the idea of having a seedling committee, and I said I would serve alone, and if the Society were short of funds and had nothing to pay for the expense, I would spend all the time and money that I possibly could, and make as many visits and examinations as I could. I have had a good deal of correspondence, besides making what personal examinations I could. The general report is that the seedlings are nearly all dead. I have a card from Mr. Samuel Bates; he says, writing from Stockton, under date of January 12, 1886:

"Mr. J. S. Harris, yours of late date at hand, in reply, would say that my whole orchard or Seedlings and all that ever bore are dead, except the Duchess and a few Wealthy, and they are badly injured, and made no visible growth the past year. I think all the crabs are badly injured but not killed. The bark was severed from the wood on all standard varieties; the sap started too soon in March and then froze which is the sole cause of all trouble.

S. BATES."

Mr. Forster writes me as follows:

"CHATFIELD, MINN., Jan. 12, 1886.

Mr. Harris:

DEAR SIR. I received a card from you wishing to know about my apple trees. Well, my seedlings are killed and so is the Wealthy with me, and about everything else except the Duchess. I do not know of anyone that has any hardy seedling apples. It has been the hardest blow for apples I ever saw and I think we are liable to have a winter every few years that will take our best winter apples; so I don't think it will pay me to belong to the Horticultural Society.

Yours Respectfully,

WM. FORSTER."

That is about the tone of answers I have been able to get on seedlings. If I had had more funds I should have visited Mr. Gideon's place at Excelsior, and some orchards in Martin County.

We have made very little progress in the raising of seedling apples. We must take seeds from the very hardiest varieties and plant them; those seeds must be raised in our climate and in our soil, and then we must select the best fruit from these seedlings, and the seeds from these again must be replanted, in order to get just what we want. But, in the mean time, as I said last night, there is a great boon coming to us in these Russian apples. Just as we accept the foreigner and recognize him as our fellow citizen, so we will accept these Russian apples as "good citizens" now, and future generations will bring out the fruit that will show the good effects of our soil and climate. I believe the day is coming when Minnesota apples will be sent to Europe, and to the eastern cities. I hardly expect to live to see that day, but if the State Horticultural Society will keep on in its efforts; if it will not become discouraged by such failures as has been occasioned by the last winter; if we can keep our courage and look

forward to the bright future which is certainly before the people, I believe that the time will come when our apples will be sought for beyond the great ocean, and when we shall have the merited reputation of producing the choicest apples that can be grown.

Col. Stevens. Mr. President, I would like to amend that report so as not to have it appear as the report of the whole State, it is confined to southern Minnesota. I know very well that Mr. Gideon has over forty varieties that are hardier than the Wealthy. I know very well that Mr. Pearce has a seedling that has proved hardier than the Duchess; last spring there was not a bud injured.

Mr. Harris. This report of the seedling committee is a report of what has come under my observation, and although I believe there is no necessity for it, I am perfectly willing to have it appear as Col. Stevens suggested.

Col. Stevens. I wish to say, as far as I understand the history of the Duchess of Oldenburg, and the Tetofsky, that they are acclimated the moment they are brought to the United States; they become acclimated at once. If I understand Mr. Harris' idea it would take two or three generations before the Russians would be acclimated. I may have misunderstood him.

Mr. Harris. I think you did not understand me. I believe the Russians, a great many of them, are as hardy as the Duchess, and that seedlings from them will improve on the old variety. Apples acquire an excellence of flavor in one locality which they do not in others, just as the Baldwin raised in a certain place is a better fruit than it is anywhere else.

Mr. Fuller. I was working for several years at Cedar Mills, where a number of seedlings were tested. The seeds were planted some fourteen years ago, seeds of the Transcendent, and the Gen. Grant. I was there last summer and saw the fruit. It was very much like the Duchess and about the size of the Gen. Grant. The trees are perfectly hardy, commenced bearing when three years old, and have borne every year since. The tree is a slow grower, it is neither blighted nor winter-killed. I have taken cions to graft and shall watch it with some interest; and another year, if of any value, I can have cions for others.

Mr. Busse. The president of the State Alliance, who resides at Fillmore, told me that he had a seedling apple tree that had borne crops for about twenty years. It came through the winter last year in perfectly sound condition. He said he would send Prof. Porter a few cions of that tree.

Mr. Harris. We heard of a good many seedlings that were said to be hardy, and Mr. Sias went with me and we visited them; when we found the trees they were on their last legs. A man who isn't much of a horticulturist sometimes makes grave mistakes in reporting upon the condition of seedlings.

Mr. Smith. I had a seedling that I thought a great deal of. It was about ten years old when it came into bearing. After the hard winter of 1872, it was then perfectly clean and hardy, hadn't a black spot on it. There is a great difference in the hardiness of seedlings that are raised from the seed of fruit grown here and of those grown elsewhere. I had a little experience in that direction. I traded for a dozen or fifteen bushels of black walnuts, and advertised them for sale, and in consequence, got orders for forty bushels. I thought the black walnut from one place would prove just as hardy as from another and I had a chance to buy some cheap in Illinois, so I sent for them, and they came and I sold the most of them and planted the balance; and every-one of those black walnuts, yearlings, killed to the ground the next winter, while the Minnesota black walnut stood all right, every one of them lived and they didn't kill last winter. I believe that trees must be acclimated. I don't think that the Siberian crab is as hardy in this climate as seedlings grown from it will be.

The motion of Col. Stevens was adopted.

The following report were then read:

RUSSIAN APPLES.

By A. W. Sias, Rochester.

Mr. President, Ladies and Gentlemen:

The past severe winter was just what was needed to thoroughly test the many new varieties of the Russian apple lately introduced. They were subjected to the ordeal of fifty degrees below zero and came out in good shape, with but few exceptions. The latest formation of cells on the new wood, was found in the fall to be well hardened up with starch, or mucilage, while many of the native sorts were spongy and full of sap. The Anis family have proven themselves to be wonderfully hardy. Mr. H. H. Howlett of Baraboo, Wisconsin, wrote me under date of Nov. 28th that what he received for Red Anis fruited last season for the first time, and the fruit was then very hard and had all the appearance of being a good keeper, and if so he would have the fruit here to show for itself. I hope this will prove just what we want for a winter fruit. One of the greatest objections with me to the Russian varieties, is that there is so few good keepers among them. I did have some faith in the Red Black that I exhibited here a year ago, but alas, fifty degrees was too much for it, and it is now in good shape for kindling wood! (This was top worked on

the Hyslop crab.) I have a few small trees four to five feet that came through the winter all right (root grafts). The Longfield was also pretty badly injured with me. It failed to ripen up in time last fall.

Chas. Gibb of Abbotsford, Canada, when at my place in 1883, pronounced what I call the Russian Green, a true Anis. This has proved to be very hardy, and most excellent in quality. Sidney Corp, one of the most successful horticulturists of Wabasha County speaks in high terms of the Autumn Streaked, and an unknown Russian bearing a fruit similar in appearance to the Tetofsky, but will keep perhaps ten days longer. The Yellow Anis also looks well with him. Reports from the Southern, Middle, and New England States, with the exception of Northern New England, are rather unfavorable to the Russian apple. This is all right, and perfectly natural. Our reports in regard to the pears, plums, Baldwins, Mann apples, Shys, Salome, etc., that they are persistently trying to crowd on to us, are also extremely unfavorable. The Russian apple is only completely adapted to a similar climate from whence it came, and that is supposed to be Minnesota. The great treeless plains of Russia are known as steppes, like plains here are designated prairies. It would seem plausible that a variety succeeding well on the arid steppes of Central Russia, should stand equally unharmed on the dry prairies of Minnesota. Planters should know the origin of every tree they purchase, and study its adaptation to their particular soil and climate.

The following paper was then read by Mr. Tuttle, of Baraboo, Wis.

SOME SUGGESTIONS ON ORCHARDING IN THE NORTHWEST.

By A. G. TUTTLE, Baraboo, Wis.

The destruction of orchards during the past year has been very general, not only in the Northwest but in regions farther south and east, where heretofore but little complaint has been made of the injurious effects of the climate.

Eminent horticulturists throughout the country have given their views of the causes that have operated to produce the destruction.

It is well, before suggesting a remedy for an evil, to know something of the causes that produce it. Before giving any views I propose to examine some of the causes assigned.

It is claimed by many that the warm weather in the fall held out so late that the sap was forced into circulation, which being succeeded by freezing, destroyed the trees. If such was the fact why were a very large proportion of the trees injured killed only on the north side while the south half was not injured, and produced a fair crop of fruit. If the sap was forced into circulation by the prolonged heat in the fall it should have been in more active circulation on the south half than on the north half of the tree. Of all trees the Duchess and other Russian fruits should have been the first to start into growth, as they finish their growth earlier and having consequently a longer season of rest, should have been the first to commence growth, and yet that class of trees suffered very little, if any, injury. The Transcendent crab, always the first to put on leaves in the spring, should have been the first to start into growth in the fall, among them we hear of no injury.

It has often been said that trees suffer injury when the warm weather in the fall

does not hold out late enough to mature the wood, so that between too little and too much heat in the fall the tree stands a very narrow chance of living, and were it not true that we have a class of trees unaffected by these conditions we might as well give up the business of growing fruit.

Another reason given is that nurserymen in grafting cut off the tap root, consequently the roots of the trees do not penetrate below frost.

If the hardiness of a tree depends upon the depth its roots penetrate the soil, the pear, of all trees should be the hardiest, for everyone knows that it sends its roots deeper into the soil than any other tree. There was very little root killing of trees by the cold of last winter. I have found the roots of all trees that were killed so far as I have examined them to be in good condition and I can see no reason why the killing of the top should be the fault of the roots, so long as the roots are in good condition. Orchard trees do sometimes, though very rarely kill in the root. Seedling trees that had never been shorn of the tap root suffered equally with others.

As an evidence that they do not require a tap root to insure hardiness we find that trees growing the farthest north, even to the northern limit of tree growth, close upon the confines of perpetual frost such as the fir, spruces and pines do not have any tap root and their whole system of roots is spread just below the surface of the ground, nor does it seem to be necessary in this latitude to insure the hardiness of the Duchess and other Russian apples and crabs.

Trees, so far as I have observed, were not killed in the root by the cold of last winter not because there was no frost in the ground. Trees were top-killed in grounds here adjoining the cemetery where in digging a grave they found five feet of frost. Many claim that the injury was in consequence of there being no frost in the ground.

It made no difference whether the ground was frozen or not, the killing was in the top and the injury was as fatal where they claim there was no frost in the ground, as where there was. Another reason given is that they were in a starved condition and so enfeebled by it that they were easily destroyed.

There seems to have been quite a difference in the kind of trees starved; while one came through in good condition another was killed. I had twenty-five trees of one variety that had been in June grass sod for twelve or fifteen years which never passed a winter apparently in better condition, and bore last season more than double the fruit of any season before.

A tree half hardy may survive under favorable conditions of soil and culture that would fail with unfavorable conditions and neglect.

If ever fruit growing in this great Northwest becomes permanently a success it will be when we have a class of fruits that need no petting and are able to flourish under neglect and extremes of climate, whatever it may be.

As with animals, so with trees and plants, one will live and flourish where another will die.

Many think that the injury done to trees is by freezing and thawing in the spring. In portions of our country where there is freezing and thawing in rapid succession during the whole winter they grow all varieties of the peach, pear, plum and cherry and also the most tender varieties of the apple. In any part of the northern states where the mercury seldom, if ever, falls much below zero all these fruits are

successfully grown, and in many portions this freezing and thawing during the whole winter is similar to what we have in the spring.

There is one other reason given for the destruction of our trees, coming from such high authority and accepted by a very large class of planters that I must not fail to notice. It is the claim made by the dishonest tree peddler, that the reason trees kill is because they are grafted in the root, and that trees budded above the surface of the ground will be perfectly hardy. Any one knows who has had any experience with seedlings exposed above the surface of the ground, that not one in a thousand will prove hardy, and that the seedling root placed below the ground will be much more likely to live than when exposed above the surface. The seedling in the root graft has the same protection we give tender vines and shrubs when we cover them with earth; and then too the hardy cion most of it placed below the surface will send out roots that will ensure the life of the tree though the seedling root should kill.

There always will be probably these traveling sharks prowling over the country doing a large business by pure unadulterated lying. They are even now selling new Russian fruits that they have not even learned the names of, at exorbitant prices.

An eastern concern has made itself notorious by claiming to sell stock of budded trees grown at Sparta, Wisconsin. Whether budded or grafted I am unable to say, but that they were grown at Sparta, Wisconsin, we have positive proof that they were not. I have less respect for a Wisconsin nurseryman who will lend himself to carry on this swindle than I have for the cheap actors in it.

Some twenty years ago I wrote an article on "Orcharding in Wisconsin." It was given as my opinion in that article that the *very extreme and long continued cold* of some of our winters was the principle cause of injury, and now after the lapse of a quarter of a century carefully noting the effect of the extremes we have passed, I am still of that opinion. Every cold winter when we have had many days in succession of very extreme cold, and when some of these days the mercury did not rise above twenty below zero at midday, I have always found injury soon to follow. In every case the extreme cold winters have been those most destructive. If we place a foliage plant in the open air with the thermometer at zero, it is soon killed and we do not hesitate to say it froze to death; so too all agree that the peach kills at about twenty degrees below, and that it is killed by severe freezing. The Baldwin, Greening or Spitzenburg apple kills in a dry atmosphere with about the same degree of cold that destroys the peach.

The winter of 1884 and 1885 was one of extreme cold. Varieties that we had hitherto considered safe to plant were badly used up. I have no doubt that it was from extreme and long continued cold, and yet I am equally confident that there are certain conditions of soil and location and of the state of this, consequent upon those conditions that tend to increase or modify the effects of extreme cold.

From what source are to come good fruits sufficiently hardy to flourish in our climate? Some claim our only hope is from seedlings produced upon our own soil. For forty years we have been planting seeds of Duchess and other hardy apples, and how stands the account to-day? There is not a tree of the thousands produced that can be said to be as hardy as Duchess unless crossed with the crab and have enough of the crab in them to reduce their size and spoil them for market apples.

If we cross the Duchess or any other hardy apple with any of the common apples we lower the standard of hardiness in the seedling produced. If we cross with the crab we generally reduce the size of the seedling and lower the quality.

I have more than a hundred seedlings of Tetofsky, most of which have fruited. They all in tree and fruit show more of the crab than the apple; some are very large and fine for crabs but the growing of crabs and Hybrids is nearly overdone, there being no market for them, or a chance even to give them away. I have several seedlings of Fameuse; some of them have borne a few apples of excellent quality. They came through last winter in good condition, but a few years of trial of trees that have borne a few apples is no test of these hardships and we have no reason to suppose they will prove any hardier than Fameuse.

Some are recommending the general planting of seedlings of only a few years growth because they were not killed by the cold of last winter. Young trees of the Ben Davis came through the winter uninjured. It is no test of the hardiness of a tree though it may have passed unscathed through such a winter as the last, not having borne previously a heavy and exhausting crop of fruit. Two seedling trees have been growing on my grounds for twenty-five years, they had passed all the hard winters during that time and were in perfect condition; they came out last spring with fine, healthy foliage and blossomed heavily. I thought there was a seedling that would do to propagate from and recommend for hardiness; both trees are now dead and with them the last hope of ever producing a seedling from the common apple sufficiently hardy for our climate.

There is a field open for experiment to which I would direct the attention of the careful pomologist. Let crosses be made with pure Russian fruits, the Zolotoreff, a very large fall apple, high colored and very showy crossed with the Repka of medium high color, a very late keeper; or the Green Streaked with the Antonouka, the former high colored and very large, a fall apple, the latter a yellowish apple of good quality and a very late keeper, these crosses would be likely to produce a seedling valuable as a market apple with keeping qualities to carry it into spring. In these crosses Russian with Russian the standard of hardiness would not be lowered, and I have no doubt an apple of great value might be produced.

I am more than ever satisfied that we are to look to Russian fruits and seedlings from them for the future orchards of the northwest.

It is certainly our only short road to successful fruit growing. These Russians have withstood for ages a climate of greater extremes than our own. We may be able ages hence to show as good a collection of hardy fruits produced from seedlings originated on our own soil as are now found in interior Russia. I think it far better however to accept the results of these labors and improve them if we can by judicious cross fertilization.

When we can show as extensive paying orchards as are found on the great plains of interior Russia, we may well lay claim to being a fruit state. It is absolutely certain that these fruits will flourish as well here as there.

I have fruited about sixty varieties of new Russian apples and have about fifty-three more varieties to fruit. Should we find nothing of more value among them, we have enough already fruited to fill the places of all the old kinds that have failed; trees that are as hardy as the Duchess and many of them hardier and fruit of better quality.

I have one orchard all Russian, comprising eighty varieties; every tree except one came through last winter unhurt and are now in good condition. One variety from the Crimea, a country much warmer than this was killed. I doubt whether an orchard be found either east or west of an equal number of varieties showing such health and vigor. This is the more remarkable as the old varieties hitherto considered iron-clads, in ground adjoining were nearly all destroyed. The country from whence these fruits came is an open prairie country, much farther north than the farthest limit of the United States, very much farther from any large body of water, consequently must have more intense cold with a much drier atmosphere. These conditions make it certain that fruits that flourish there will be at home in all the prairie regions of the northwest.

That our trees freeze to death, I have not the least doubt, but why one kills and another does not, is something I don't understand and probably never shall.

Prof. Budd claims that trees freeze to death by the expansion of the sap in the sap vessels caused by severe freezing. This is an old theory and one I could never accept. That portion of the tree containing the sap vessels is as easily frozen as a potato, and I can see no reason why the sap should not be as thoroughly frozen and expanded, with the thermometer at zero as at thirty or forty below, and yet with the mercury at zero we suffer no injury. It is claimed that the difference in the sap cells of the different varieties determines the different degrees of hardiness; allowing this to be true, how do we account for the fact that trees of the same variety side by side, one kills and the other does not, or how do we account for a tree being half destroyed and the other half uninjured. If the sap cells are alike and all parts of the tree are subjected to the same degree of cold, the effects of the freezing should be the same.

It is not necessary for us to be able to explain why one variety kills and another does not, the fact is all that is necessary for us to know until we are able to go back in creation to the great first cause and explain the phenomena of its existence. We shall find many mysteries in nature we cannot solve; science can only reveal to us a few faint glimmerings of that effulgent light that shines beyond the reach of human vision. Only in another state of existence, if ever, shall we be able to comprehend the wonderful mysteries that nature withholds from us here.

Let us accept the facts as they present themselves rather than adopt a theory and spend all our energies to make facts conform to it. I made a thorough examination of my shrubs and vines the first day they were thawed after the severe cold in February; the injury was as apparent then as it was a month afterwards.

The evidence was as conclusive to me that they had frozen to death as it would have been had I found a person who had perished in a Dakota blizzard. I would as soon have entertained the idea that the person had died of sun stroke or fever as that thawing killed the trees.

Vines, shrubs and small fruits can be protected, but our orchard fruits, apples, pears, plums, and cherries should be sufficiently hardy to withstand any amount of cold we may be liable to have.

The time may come when we can determine the hardiness of a tree or plant by microscopic examinations of its leaves or sap cells, but I have far more faith in the long tests that have been made on the great plains of interior Russia or in this portion of our own country.

REPORT ON RUSSIAN APPLES.

By ANDREW PETERSON, Waconia.

Secretary of the Minnesota State Horticultural Society:

DEAR SIR:—As you ask for a short report on Russian apple trees, I will do so, but of course it will be short because I cannot write the English language myself. As I said in the report last spring, that the Hiberna, Ostrekoff's Glass, Lieby and Charlamoff, these four varieties were not injured by the cold last winter, and bore a heavy crop this summer, rather too heavy, but the fruit was not quite as large as they used to be. I suppose that was because the fruit bud was swelled out too much by the fine weather late in the fall of 1884; and I had a few Wealthy trees that was not entirely killed last winter, and the fruit on them was smaller than they used to be, and also the Crab apples, and the orchards in my neighborhood as far as I have examined them, the fruit was a good deal smaller than it used to be. The Duchess of Oldenburg was a good deal damaged but not killed, and bore a heavy crop. The Russian White Astrachan is nearly a Duchess, but not quite; in tree and fruit seems to be hardier than the Duchess, and is a good bearer.

The Winter Lowland are hard trees, have bore a few apples this summer, the fruit middle size and middling good quality; not a winter apple, but late fall. Red Cheeked apple bore a few apples this summer for the first time, size of fruit some larger than the Transcendent but sour; good for a cooking apple; the trees are the hardiest I have seen. When the wood of the Transcendent took some color last winter, these Red Cheeked trees did not take any color at all. The small Russian trees that I received from Prof. Budd most of them stood the winter good, but some varieties were damaged more or less. The Red Anisette were not injured at all, and neither was the Antanouka.

The pear trees I received from Prof. Budd were colored some, but not much, and also the Russian plums. The grapes I raise are Concord, Delaware, Isabelle, Hartford Prolific, Iona. All bore a heavy crop, and a very heavy crop. Of the raspberries the same may be said of Philadelphia and Turner.

REPORT FROM CARVER COUNTY.

By CHAS. LUEDLOFF, Carver.

No previous winter has been so severe on fruit trees as the last one and new and extensive demands are made upon the pomologist to regain what has been lost. Many causes, which are injurious to fruit trees, can be removed by a scientific pomologist, through remedies which by experience have proven to be valuable. But other causes, which in their operations are harmless to the tree, cannot be overcome or guarded against; such are the extreme cold during the winter months, or the heavy frosts in the spring, or fall, before the sap had matured the wood. If this is the case, then we must endeavor to assist nature in accomplishing a restoration.

The injury done on fruit trees last winter was not alone caused by extreme coldness, but is more largely due to the fact that the sap had not matured the wood of the tree sufficiently. The sap froze into ice, and the effect of this was to cause

bursting of the sap cells, and it became, for this reason impossible, or better said, perhaps difficult for the sap to recede. By this expression the sap "recedes" the gardener will understand that when the sap thickens and with difficulty passes through the cells, a condition is produced causing leaves to fall; and the pomologist should then observe the maturity of the terminal buds. An equally fatal occurrence for fruit trees experienced happening here last winter, happened in the year 1829, in Germany. In October of that year the fruit trees were in "full sap" when a cold spell, accompanied by a snow storm, set in, the snow remaining until the month of April following. The prune trees ("Prunus domestica") were mostly all destroyed, and apple and pear trees had to be cut down. Some nurseryman adopted the plan of top grafting but the expedient totally failed; all trees were killed to the snow line.

This shows that here and there, at great intervals, such disasters will occur, but it should not induce us to stop the planting of fruit trees, or the raising of fruit.

The loss of trees on my place is great; different kinds which have withstood severe winters heretofore are dead. Top grafted Russian varieties, Minnesota and Wisconsin seedlings, are all destroyed. It is my judgment that top grafting is not advisable; we thereby get no hardy trees, and such trees are the first to die.

Our hardy kinds should be replanted, and the approved Russians also; replacing with root grafts, or yearlings, would be the best. I think it not advisable to transplant two year old trees which have partially withstood the last winter. Such trees are subject to the "black-heart." My yearling trees were transplanted by cutting them back to sound wood, and with two year old trees the same process would be beneficial.

The kinds which withstood the winter best are: Russian Green, Ostrekoff Glass, Lieby, Kurski, Smelling Apple, Round Wassen, Arcade, Switzer, Charlamoff, Beel, St. Peter, Milton, Red Lake, Lake Winter, Whitney's No. 20, Dartt's Hybrid.

The Bessemianka Pear trees were killed to the snow line. Ostheim Cherries came through the winter all right. Plums of our best native varieties all sound, and brought a heavy crop. Blackberries, Doolittle, Seneca, and Mammoth Cluster were killed to the snow line. Gooseberries, Downing's Industry came out all right. Also the Currants, White and Red Dutch, Grape Currants, Fay's Prolific, all bringing a good crop.

Strawberries were uninjured and brought a heavy crop. From the different kinds I had on trial I find the best adapted for my location the following: Glendale, Champion, Crescent, Green Prolific, and Wilson.

I find no injury on grapes, and think we have nothing to fear hereafter when they are properly covered with earth. From the many kinds I had on trial I find the best for my location and soil the following: Progress, No. 30, 33, 43, Lady, Grein's Extra Early, Minnesota Beauty, Cambridge, Rochester, Telegraph, Martha, Hartford Prolific, Worden Seedling, Moore's Early, Concord, Miles, Delaware and Amtnia.

Berbary vulgaris were killed to the snow line; the Rhamnus Catharticus (Buck-thorn) near by, came through the winter all sound making a robust growth and produced a fine show of its fruit in the fall. This and the *Caragam abarescens*, also the *Juniperus Virginiana* (Red Ceder) I consider the best hedge plant for our climate.

DISCUSSION.

Mr. Harris. Mr. President, I consider these four reports that we have received of very great value to the State of Minnesota.

On motion, it was carried that in speaking each member be limited to five minutes, and to speak but once upon a subject until all who desired to speak had spoken.

Mr. Harris. One of the gentlemen spoke about the White Astrachan coming out perfectly well with him. I supposed it to be the hardiest apple we have; but last spring I visited one tree that was perfectly dead; so that it is not perfectly hardy under all conditions.

Mr. Tuttle. I want to say that the White Astrachan as commonly known is not the real White Astrachan, according to the description given me. The tree that I received from the Agricultural Department I think is not the true White Astrachan. It resembles very much a tree coming from the department under the name of Gen. Grant. It seems very hardy, and was not hurt at all last winter.

Mr. Pearce. I think this is a question that ought to be discussed very thoroughly. The propagators of these Russian fruits who have handled the trees are perhaps most capable of forming a correct idea of their value. I was very much pleased with the report of our friend Mr. Tuttle. Some pretend that the spring freezing kills our trees; others say that the extreme cold of winter kills them.

In the last few years some people seem to have formed the opinion that it is the hard winds that kill the trees. The Russian varieties are generally very early; they mature their fruit early; they cast their leaves early; on this account last season they were injured after the buds were out. The only objection is they are short lived; they may live five, six or seven years, but I will guarantee that time will bring them. Here is the Yellow Transparent, and I might say forty or fifty varieties that were scattered over this country ten or fifteen years ago; they bore fruit; people thought they had a good thing. There came such a year as last year, and the result was almost everything was killed. I knew one variety that was apparently adapted to that particular kind of soil where it had been planted; it continued longer in growing than the others. Now, those same varieties on high lands have come through, generally, in good condition. I have examined trees all over the country, and have observed this to be true; while on the low land, in warm localities, all the varieties of the Russians were injured, especially the White Transparent.

Mr. Tuttle. I have understood that the tree that is called the Trans-

parent is not the true Transparent. I grafted ten thousand trees that were sent to me as Transparents, and out of that ten thousand there is not a tree that is worth a cent—not one. You can pick out the rows standing in my pasture ground where the old trees stood in the nursery. You can't find one tree in fifty but what is killed. Part of the Tetofsky are killed; it is an apparent failure, but it is no test of the Russian apples in general that this one variety kills.

Mr. Sias. I believe what we want is to get grafts of the Russian apples. Mr. Tuttle has touched upon an important subject in his paper; and I am very glad he has had the courage to mention it, for writers generally feel a little delicacy in speaking of it, as their motives might be misconstrued, and that is the reference to foreign nurserymen bringing in and selling, under fancy names, all sorts of things. In Dayton, Ohio, and that vicinity they have more extensive nurseries than almost any other part of the country, so far as I know, and they send a great many men into this Northwestern country. They come here, and find a man that has some little reputation for doing an honest business, and they want to sell their miserable stock on his reputation. I have been interviewed several times by these same parties and asked to allow them to use my name to sell stock. They said if I had a surplus of anything of course they would buy some of it; but they wanted to use my name in selling stock, and have named parties in the northwest that were doing the same business, and said they thought it would make it mutually profitable to do so. Of course I have always answered these fellows that I would allow no one to use my name unless they had my stock along with it.

One of these fellows called a few days ago to talk with me; I asked him what varieties he was selling mostly; he said they were running heavy on the Mann apple and the Pewaukee, and that class of fruits; and they were selling a great many of the Irish Juniper, etc.; I told him he was doing wrong; they were entirely worthless, and I had seen them tested, and knew they were all of no use whatever. A year ago I told a fellow the same thing, and I found out that he had sold some hundred of them to my neighbors. So you see how it goes; all they want is your money.

Mr. Latham. The buyer goes and gets his trees, and the agent goes into another section of the country. I don't think that these Ohio men always come to nurseries to ask permission to use their name in selling stock. During the past season we have talked with farmers in the vicinity of the Excelsior nurseries, who have been solicited by for-

eign agents and who said that they represented themselves as selling for the Excelsior nurseries. I am aware that in this discussion of Russian apples, much has well been said about the varieties that have not succeeded, but I want to know what varieties have succeeded. I would like to plant a few more of them; I would like to try those that have done the best. Of about forty varieties of Russians on my place the most of them were root grafts; they came from the scientific department at Washington some twelve years ago. Those I grew in the nursery and transplanted into the orchard; they were well cultivated and cared for, the same as the Wealthy. The Wealthy came into bearing, and they did not. For the past three years I have noticed that two of these trees have made a very vigorous growth. They attained about the size of the largest Wealthy; they appear much akin to it; I can hardly tell them apart. The trees were not seriously injured by the severe winter. The other 25 or 30 varieties have borne scarcely anything; some of them are blighted badly. The leaves are smooth, and have an unhealthy color, but I hope something may come of them yet. I have perhaps twenty others that were top grafts on the Duchess. They are all alive, and most of them have borne fruit. There is nothing very nice among the fruit however. When perfectly ripe they are as good as the Duchess; perhaps not quite as sour. When not quite ripe, there is a little bitterness about them, that condemns them for eating. It bruises very easily. I don't think it is an apple that could be handled. It is a valuable apple for home use, but I don't think it will be valuable for the market.

Mr. Tuttle. I mentioned these trees particularly for the reason that they show that the root grafts are better than the top grafts. When a man sells a thing that I know is worthless by means of persistent misrepresentation, and at an extravagant price; for instance, the Russian Mulberry at \$1.50 that costs him five cents, I do not wonder that people lose faith in fruit growing. Every seedling that is grown has to go through years of testing and trial.

Mr. Sias. Mr. President, there has been considerable said about the quality of the fruit of these new Russians, and I would like to see this matter put to a severe test. I don't want to propagate an inferior variety when I know it, and I would move you that the Chair appoint a committee of three to meet during the time of the State Fair and select half a dozen of the best Russian apples, and a like number of the very best natives, to compare them carefully, and report at our next annual meeting upon their comparative merits. It is an important

point. If these Russian apples are worthless, we should take measures to have the facts ascertained at once.

Mr. Harris. Mr. President, I am very glad to second that motion.

Mr. Busch. Thirteen years ago I grafted a good many Russian cions on crabs, and my neighbors did the same, almost without exception, and now they are dead. Last spring I sent to Prof. Budd for trees of these newer varieties. He sent me some thirty-five varieties, and most of them seem to be good. A few came out in good shape through the summer, and some did not. One kind seems to be blighting so that I don't depend much on them. Now, as to quality; I am not yet satisfied as to the quality. We don't want to grow hardy apples and have to feed them to the hogs.

Mr. Kellogg. At our state fair in Wisconsin, we had an exhibition of about sixty varieties—I haven't the numbers with me now,—of the new Russian varieties, don't count the Alexander, and Tetofsky new Russians any more; of these fifty or sixty kinds I think there was at least ten or fifteen that came up in quality to the Duchess, Fameuse and Wealthy, and that class of fruits that are considered to be hardy.

Mr. Tuttle. I would say that Mr. Kellogg was chairman of the committee on apples at our state fair, tasted the fruit, and satisfied himself as to the quality.

The motion of Mr. Sias was adopted.

Col. Stevens. I have a short resolution which I wish to read now, which the members can be thinking about, and it can be taken up later:

Resolved. By the State Horticultural Society in convention assembled, that J. S. Harris of La Crescent, A. W. Sias of Rochester, and George W. Fuller of Litchfield, be and are hereby appointed a commission to visit all portions of the State during the early autumn of 1886, for the purpose of thoroughly examining the different seedling apples and other fruit trees, and plants, and to report the result of their labor to the Society, at its annual winter meeting in 1887.

Resolved. That the sum of \$150 not otherwise appropriated, be and is hereby appropriated to defray the expenses of said commission, in gathering such useful information as they may deem of value to the Society.

Mr. Kellogg. I think that the following varieties of the Russian apple are equal to the Wealthy: The Transparent, which comes under five different names, the Yellow, Red, White, Red Cheek, and Charleton Thaler; those are all one variety; the Summer Lowland; Roland Raspberry, Green Streaked Raspberry, Yellow White, White Russet, and the Reptka, which are varieties as good as any that I know of that have been mentioned in our discussions.

The Chair named as the committee on apples at the State Fair, Messrs. Wyman Elliot, Prof. E. D. Porter and H. H. Young, Secretary of the State Board of Immigration.

Mr. Tuttle stated that he would exhibit specimens of the Russian apples at the next State Fair.

Mr. Latham. I would like to see them exhibited, with a section of the wood, showing three or four years' growth. I have no doubt that many Russians are doing well, and winter well. I had a few bushels this year that were almost worthless for eating; my family would not eat them; they took apples from the market instead. And so I say let us have the Russian apples from this section with specimens of the wood, so that we can see what the apple is as grown here.

President Smith. I would suggest that we offer premiums on apples with samples of the wood accompanying.

Mr. Elliot. It seems to me that we have taken a good deal of time for this Russian apple discussion, and we ought to get to our premium list pretty soon.

President Smith. The next order of business will be discussion of premium list at the State Fair.

THE PREMIUM LIST.

Mr. Harris. Mr. President, it has been impossible to get anything like such a premium list at our State Fair as we ought to have. The whole time of the executive board of that association generally is consumed in looking after the interest of the blooded horse, the Short-horn, and Jersey cattle, and when they get down to the premium list of fruits, it is the last thing and the money is about exhausted. I think we ought to appoint a committee of about three to prepare a premium list on fruits, and demand an audience with the executive board of the State Fair association.

President Smith. I am tenacious upon this point. If we go in with that Society, with the state appropriation entirely in their hands, we have nothing to expect from them. I hold that this Society should at this meeting make out a premium list, or instruct our Executive Committee to make out a premium list, present it to them at their meeting next Tuesday, and ask them to furnish funds to pay these premiums. If they expect us to join hands with them, they should understand that we, as the oldest society in the State, are entitled to this consideration. Let us make our premium list liberal enough so that it will be a benefit to the whole State of Minnesota, and not one that will benefit one or two nurserymen, and exclude everybody else. Let us have premiums on single plates, and upon articles of merit; and present a premium

list that will show to the world what Minnesota can do. Then if you want to offer premiums upon sweepstakes, do so, but let us ask them for what is our right, and if we cannot get it, let us apply to the legislature next time. That, gentleman is the position I take in this matter. We are not begging in this matter; we are helping to build up this State. We have helped to build up this Society and have helped to build up that as well; and we propose to work hand in hand with them, but we want them to show us some consideration as a Society. I ask nothing for myself, and this matter should not be in the hands of the President and Secretary; but it should be in charge of a committee of three, which should be selected with care; and they should decide what amount will be required to make liberal premiums, and then they should demand of the Agricultural Society funds sufficient to pay that list of premiums. I would say make our premiums liberal if we have any spare funds. Now that, gentleman, is my position on the premium list; and I think it is one of the most important matters to come before our Society.

I suggest that we would increase the interest of the people generally by offering premiums of subscriptions to an agricultural paper, or by offering premiums of membership in this or in the Agricultural Society for one year. It will save funds for our Society, and help to save funds to the State Agricultural Society, and help increase our usefulness as a Society. That is the object of our Society—to throw the seed broadcast, to each and every individual in the State. This Society is not organized for the benefit of St. Paul and Minneapolis alone, it is for the whole State of Minnesota.

Mr. Smith. I think that is exacty what we want. As Mr. Harris said, at one time last year it looked as if we should have a good premium list. I advocated then that the premiums should be placed on all such things as the farmers can raise through the entire State, and should be so arranged that there would be a great number of them, and on a large variety of these products; that they would be scattered throughout the State. Another thing that should receive our attention is the giving of premiums on small fruits, preserved in liquor or sugar, or any other form so as to bring them there. Now, at the time of the State Fair, currants and strawberries of course have gone by. Still we might have specimens of them exhibited, and there should be a statement with these in regard to the variety, the locality where they were grown, the amount produged, and the conditions under which they were grown. This idea of having specimens of the wood accom-

panying the apple I think is a good one. I will offer this as a resolution, that the Executive Committee be instructed to prepare a premium list to be submitted to this Society, not later than Friday morning, for approval and amendment, which premium list that committee shall present next week to the Agricultural Society with a demand of recognition by that Society.

President Smith. We want the list prepared and published in our reports.

Mr. Gould. I would recommend that the committee go to work as soon as possible and get it ready.

Col. Stevens. Mr. President, I apprehend there will be no difficulty, as far as the State Fair Association is concerned, in granting us all we claim. Heretofore the Society has been handicapped, they hadn't funds to make such appropriations for premiums as they would like to do. Until the past year officers of that Society and some of the stockholders have been members of this Society, and have always been in favor of making as large premium lists as their funds would allow. I am very well convinced that the Executive Committee of that Society have a friendly feeling towards the State horticulturists. We have had Mr. Harris to represent us there, a gentleman who is favorably known throughout the whole State, not only in the interest of horticulture, but in the interest of agriculture as well; and I think that if we in a gentle manner make known our wants to them, that they will grant them at once. It has been exceedingly necessary in the past, and it is necessary now, that everyone should do all in his power to advance the interests of the Minnesota State Agricultural Society, especially when its fair grounds are located as they now are, within the easy reach of these two big cities, and when our railroads are extending to every neighborhood in the State. It is necessary that we do all we can to sustain that Society, and at the same time to help ourselves.

President Smith. I would state that the horticultural exhibit has always taken place entirely under our charge up to two years ago. Why they should change, that I don't know. I took it for granted they had something against me as President of the Society, and I tendered my resignation when the Agricultural and Horticultural Society had met in conjunction, but that resignation was not accepted. They never printed a premium list until the 12th day of August. I spoke to Mr. Clarke about it, as President; he said they hadn't thought anything about it. They thought the Society of Horticulture was of very

little importance. I think we should prepare our premium list and present it to them with a request for the funds to pay it, so that they cannot have a chance to say that they didn't know what our wants were.

Col. Stevens. That is right.

Mr. Smith. If the amount appropriated to the Agricultural Society had been increased, a proportionate sum should be due the Horticultural Society, whether that amount of money is \$2,000 or \$500; in the hands of the Horticultural Society the same amount of money would go twice as far. No extravagant amount for premiums should be asked, but what is due us we should have; that appropriation should be under the control of this Society, and its Executive Committee.

Col. Stevens. I fully concur in what our President has said. Last year the Agricultural Society took in between \$50,000 and \$60,000. It paid off a debt of some \$20,000 or \$30,000 for its buildings. They have got money in the treasury now. I suppose next year they should take in the same amount of money; probably they will; and if they do, we certainly should be entitled to get our share of that, so we would be entitled to \$5,000 perhaps. That would leave them \$45,000 or \$50,000. I don't suppose the Society wants to get money in the treasury, to any extent, hence we could rightfully ask them to be reasonable, and give us, say \$5,000. With that sum we could make a grand exhibition which would do more for us than ever has been done.

Mr. Elliot. I have had some experience with the State Agricultural Society. I have had the pleasure of being one of the board. I have seen the same question come up before the Agricultural Board and the way that they treat it. I will venture to say that we don't get a thousand dollars.

President Smith. No; what has been the record in the past? We have never been able to get over \$500 or \$700.

A Member. The only way for us to do it is to make up our premiums, not an extravagant list, but make such a list as we shall not be ashamed of, and put it before that board, and if they do not see fit to accept it, let us not hold any fair.

Mr. Smith. Or, if they do not accept it, let us go to the Minneapolis Exposition, and ask them what they will give us.

Col. Stevens. Never!

Mr. Pearce. I am interested in the State Fair, but it is my opinion that the Agricultural Society know no other society except their own; they don't know the State Horticultural Society. They expect to go

to work and make up a premium list all the way through, including horses, cattle, sheep, bulls, and everything else. But we are just as independent as they are, precisely. We can hold our own fair, and we have the money to do it; and we have the right to do it just as much as they have. But if the thing can be arranged satisfactorily, and we get what is our due, I say go in; if not, stay out.

Mr. Kellogg. Mr. President, I don't believe in being too gentle in approaching them about this matter. Make up your premium list as high as you think proper, and say that your Executive Committee shall have control of it. If they make their premiums \$25 on horses, put that down as the first premium on fruit.

Mr. Harris. Mr. Kellogg has expressed my ideas exactly. If they don't want our exhibits enough to give fair premiums, let us have a fair of our own. I would rather attend a horticultural fair here in Minneapolis, even if I failed to get a dollar, and know that I stood on an equal footing with the other exhibitors there, than to go into the State fair where the horse and the bull receive a \$25 premium, and the apple, which represents the care and attention of twenty years in bringing to its present perfection, gets only an insignificant sum of a dollar or two.

Mr. Gould. I think we should take a reasonable view. I think the only thing to talk about is to hold our fair in conjunction with the State fair. There is a larger number of people that contemplate going there than on any other occasion, and they expect, more or less of them, to see all there is to be seen—all of the fruits and products of the State that are worth seeing. Some of them come a long distance. One may go to see the fruits, or perhaps some one kind of fruit; he may be interested in apples or grapes, another in small fruits; but each one expects to find what he goes to see, and for that reason it affords the greatest and best opportunity for a general inspection at a State fair. Now, we could have a little one-horse thing of our own. We might get great satisfaction out of it; but the people at large would not see it; it would be out of their reach; they couldn't afford to come from a distance just for that. But they all come one day in order to see the State fair; that is the place that attracts the crowd. Now, I think we may as well drop the idea of exhibiting independently and make the best terms we can with the management.

Mr. Harris. I don't think we will have any difficulty at all in making satisfactory arrangements.

Mr. Gould. I think we had better offer liberal premiums. There

has been no inducement to the Society or any member of the Society to take pains to improve exhibitions, because the premium list has been somewhat light. The fast horse, or blooded bull, and other favorite animals get liberal premiums; there has been too little money reserved for premiums on fruit. I think that now, the way the State Agricultural Society is fixed, they can be and will be more liberal, and I am in favor of giving a pretty large and liberal list.

President Smith. We do not wish to propose an independent exhibit, but this Society should request of them that our premium list be adopted.

Col. Stevens. I am a member of the State Agricultural Society; so is Mr. Elliot, and Mr. Harris, and Mr. Grimes, and several others here. I think if we don't get what we want it is our own fault. Let these gentlemen attend the meetings of the Agricultural Society and tell them what they want. This Society has a member on the executive board of that society; I have been a member of the executive board, Mr. Elliot has been, and Mr. Harris has been; so we are as much to blame as they are.

Mr. Elliot. The representative of the State Horticultural Society on that board has four to contend with; he has the secretary and president to contend with, and as a general thing the president of the society is a stock man; he has been for years; his interests run in that direction; they don't run to horticulture, and it is almost impossible to get anything for horticulture. They will give you a certain amount; they will take the old premium list and say, "Well we want about what we had last year, I should say; if the State Horticultural Society wants to give any additional premiums to what they had before, they can do it." In that way we are shut off, and I think it is about time that this Society made up a premium list and presented it. I would like to have any member of this Society put in our question box what he would like to see premiums offered upon, and let the Executive Committee take those suggestions and arrange them. I don't know that they can get to it to present a full list between now and Friday morning, but they will be able to present a premium list at the annual meeting for them to act upon; and in that way we can get something.

Mr. Smith. I think we ought to put this matter squarely before the Agricultural Society, and ask them for a full and fair recognition on their premium list, such as we are rightfully entitled to, and if we don't get it I believe that sufficient can be raised from other sources,

if the Executive Committee of this Society will take hold of the matter, they can have a fair that will not only be a credit to fruit growing and horticulture, but that will bring us enough to pay all premiums; but I believe that they will come to our terms when we go to them in a proper way and demand our rights.

Mr. Harris. I don't think we will have to entreat them very much to get a good show.

Mr. Latham. I think the Executive Committee should be given some discretion in the matter. Suppose we make up a premium list and present it, and they refuse to consider it. Are we going to tell them that we will get up a fair of our own? You see what sort of a position that would place us in. The Agricultural Society would hold their fair, and they would still get up a very good horticultural display, and then what will the Horticultural Society do? I think that we had better approach them in an amicable way, and adjust this matter.

Mr. Busse. The people of the whole State are interested in this subject; the State fair grounds have been paid for by the State, and it is the duty of this Society to present them our premium list; if they object, ask them to state their objections. Then if our Executive Committee can agree with them, the premium list can be modified so that it will be agreeable to the members of the Agricultural Society. They should harmonize this matter for the best interests of both Societies.

President Smith. I don't think that anyone here intends to go there in a spirit of dictation, or believe that our Executive Committee should make their demand in an arbitrary manner. But we want to make our wishes known in a way that will be thoroughly understood.

Mr. Latham. I would offer the suggestions that the Horticultural Society have erected a suitable building for our exhibits. I think that suggestion might well come from this Society.

President Smith. I suppose that would have to come in after the next Legislature meets; I don't suppose it is feasible at present. We shall have to put up with such accommodations as we can get. The ground is staked out for a very fine Horticultural Hall there, and whenever the funds are procured, it will be ready.

Mr. Cutler. I would suggest that the horticultural exhibit be placed where it was last fall, in the main building. I think they can give us enough room in that building to have our display, if they are willing to.

President Smith. I would suggest that the whole thing be left in the hands of our Executive Committee.

QUESTION BOX.

The following question was then read:

Has any one in Minnesota been humbugged by Iowa nurserymen? and if so, by what firms?

Col. Stevens. Mr. President, I have had a pretty large acquaintance with the nurserymen doing business in Minnesota, perhaps more so than any other man, in consequence of my business connection. I never have heard the first word of complaint in this State of an Iowa nurseryman.

Mr. Harris. And I believe I can say the same.

Mr. Gould. The thing seems to be all one way. I would like to know if anyone has heard of any humbug nurserymen in Minnesota.

Mr. Gaylord. I will say that I think that you have got a good many better men up here than I have got behind me.

The next question was, How should root grafts be cared for?

Mr. Harris. Mr. President, I think the subject is of such importance that we ought to ask some experienced man to write an article upon it.

Mr. Tuttle was called for.

Mr. Tuttle. Most anybody can graft a root graft. It is a very easy matter. The parts will very readily grow together. The principal difficulty I have is in preserving grafts in good condition after setting. My practice is to pack them in sawdust. It is important to have the right degree of moisture. I get it as it comes from the saw; if too dry they will come forward too quick.

In setting, care should be taken to set them so that the lower end will be solid in the ground; when it is loose it will not grow. I have seen grafts set sometimes when I could take hold of the top and shake it. Set in that way there will not one in twenty grow.

There is one thing that I have observed. We used to use wax in grafting; we finally got to using twine or simple cotton yarn, waxing it, running the thread through the wax and twisting it on. We practiced that a number of years. Finally, I didn't think there was any benefit in the wax, and since that I have used the simple cotton yarn without any wax, and I never had any grafts grow better; it is all nonsense about wax.

A Member. About what temperature do you keep the grafts?

Mr. Tuttle. Well, about as cool as you can keep them without freezing.

A Member. About thirty-five or forty degrees?

Mr. Tuttle. Yes; the cooler you keep them the better. I generally enclose my cellar and keep it shut after the warm weather commences; if we have pretty cold nights, I open it at that time and shut it up in the day-time.

A Member. Do you form a union by splicing the graft?

Mr. Tuttle. Yes, sir.

Mr. Pearce. Did you ever graft without any string at all?

Mr. Tuttle. I have grafted without any string at all, and they grew very well. I did it just for trial. The object of the string is to hold the grafts in place. They are easily put out of place, and in packing them some of them would move out of place, and it is merely to hold them together that the string is used. They will grow together with ordinary care. You must be careful not to disturb the union when you are setting.

A Member. Do you use any mulching?

Mr. Tuttle. No, sir. The great thing is setting the grafts. There are ten times as many lost in setting as in anything else. We have a dibble that we press into the ground; we put the graft in and press up the dirt so that the graft is set perfectly solid.

Mr. Sias. I never undertook to graft either root grafts or top grafts without wax until 1883. I learned that while on a visit to Mr. Tuttle's place; that was the first I heard of it—and since then I have practiced it myself with satisfactory results. I will say, in regard to sawdust I have always supposed that the sawdust, just as it came from the saw was about the right degree of moisture; but it is frequently thrown out of the mill, where the snow and rain gets on it, and is frequently much too wet. That is all the difficulty I know of in regard to keeping root grafts.

Mr. Gould. I suppose the question was asked for the purpose of getting information so that farmers would know how to raise trees from root grafts. I will say as far as I can gather from my own experience in the matter, that the grafts should be planted firmly in the ground; that is, the bottom of the root should be planted in the earth. The earth should be worked deeper than the bottom of the root; that is very important, because if it comes on dry, down in the hard pan, they are almost sure to die—would not live through July if there happens to be a dry spell. When the grafts start in June, they should be watched carefully to see that there are no little worms on the leaves; if the leaves are touched, the worms will drop on the ground and it is difficult to find them. There may be two or three of them about the

same size, some green and some gray; they destroy a great many young trees some years, and there are always more or less of them.

Col. Stevens. I move this discussion be continued. I understand that the distinguished fruit-grower from Ripon, Wis., Mr. C. H. Hamilton, is present, and I move that he be requested to take a seat on the floor and participate in our debates and proceedings, and that the committee on hospitalities see that he has a pleasant home while he is with us.

Both motions were carried unanimously.

Mr. Barrett, of Brown's Valley, being called upon, came forward and said:

Mr. Chairman and Gentlemen:

I confess that I feel some misgivings, seeing that I am just beginning in the work,—that is, professionally, (though for years I have been engaged in the business, in a small way, in Wisconsin, where I have given considerable attention to horticulture),—but I say I have some misgivings in trying to make a report to men of many years' experience who know more than I do about these matters; therefore, if my statements are not found to be correct, I shall thank you if you will set me right. I will state that I reside in Traverse County, Dakota, a new county that borders on Lake Traverse on the east. Brown's Valley is on a neck of land on Lake Traverse.

Mr. Barrett then proceeded to read the following paper:

PROGRESSIVE PRIMARIES FOR FRUIT GROWING.

By J. O. BARRETT, Brown's Valley.

A great diversity of opinion prevails in the new county of Traverse and its environment, respecting the permanent success of fruit and fruit plants. While there are cases of sheer neglect, compelling plants to "live at a poor dying rate," the careful observer will also notice a marked difference as to their health and thriftiness even in localities where they are properly cared for, with good drainage and similarity of soil, both in hardiness and culture. On some rightly managed claims, forest trees do well, while on others, equally favorable to all appearances, a heavy per cent of cottonwoods die out year after year, even when they have attained quite a large size; so of the box elders, the soft maples and other trees. An experienced tree man of that county, formerly proprietor of a nursery in the East, says: "It is safe to calculate, that, as a rule during the eight years allotted for proving-up, the entire ten acres have to be the same as reset to insure success."

What obtains with our forests trees obtains to a more marked degree with our fruit plants. Seldom does a first experiment prove a success. This is the experience generally, even with those who are posted in horticultural art. We have all

learned that we cannot safely use the same methods as in the East whence we came, and have to be very particular as to the variety and institute adaptable methods with the expectation then of early cremating a goodly number of our costly candidates. A well-to-do farmer, resident in that county, who formerly made orchard in a business in New York, said to me the other day, that he was "utterly discouraged in trying to grow apple trees, cherry, or even small fruits." Last spring, from the same lot of crab and apple trees, two years old, consisting of the Whitney No. 20, the Wealthy and Duchess, I sold different amounts to men whom I personally know are posted in the art of fruit growing. While most of them reported in the fall that their trees had lived, timbered well, and promised safe wintering, others, whose orchard localities appeared every way favorable, reported that, while many of the trees lived, they did not grow, scarcely any timbering out to any appreciable extent. Though failure is the rule thus far, we have beautiful exceptions.

A gentleman by the name of Bowman who lives on the shores of Big Stone Lake, a very candid man, said to me last fall that he had raised seventy-five bushels of apples; that among the varieties he was growing were a number of trees which he had brought from the East; he also said that those trees then in bearing were producing some of the best apples he had ever seen. He was a very modest man, but from his report I should judge that he has some valuable fruit.

In special localities we have some thrifty young orchards, yearly bearing fruit, some of the trees native, from the seed, with fruit equal to the best. Crab-apple trees do finely in our alluvial soils that are well drained and kept friable, wherein is embedded and rotting the bones of buffaloes and other wild animals, washed in from the plains above. The exceptions keep our hope alive, that in due time, with unfaltering perseverance, success will crown the enterprise. As respects small fruits, discouragements obtain, but not so generally as with apples.

The diverse results of experimentation are by no means circumscribed to our section of the State, but, so far as I can learn, characterize the newly cultivated regions of our prairies west of the big woods, and over the vast domain of Dakota. Our soil is rich, under it is a clay stratum to hold the moisture, and every year's tillage better fits it for high types of plants. Though we are but a few years old, as prairie farmers, we have come to the conclusion that we must vary our crops and give more attention to stock raising and the dairy, as fundamental to feeding our soil with proper pabulum wherewith to develop next the fruitful orchard and garden.

Obviously there is no uniformity in the constituents of our soils. Some localities, doubtless, have an excess of what is vaguely called alkali; others are deficient in this respect. Silica may be wanting here and there, or where abundant, there may not be enough potash to hold it in solution for available appropriation. Though iron properties are not wanting, they may not yet be chemically fitted to feed the roots. Though our soils, in the main, may have all the ingredients deemed essential to fruit growing, yet they may not be progressed enough as primates from the original rocks, nor old enough in fertilization, to warrant general success. In certain chemical relations and proportions, water, carbonic acid, ammonia and inorganic matters are the food of plants; for vigorous thrift and complete maturity these must be supplied to act simultaneously and in progressed constituency. As a man will die, if only a single condition of his existence, air or water, for instance, is

withdrawn, so the perfect development of a plant is obstructed, if, indeed its death does not ensue, when one of its means of nourishment fails. It illy becomes us, then, to wonder at failures, and give up the undertaking; our business is to understand our business, and know how to feed our plants with what they naturally need to live, grow and bear fruit.

Allow me here a condensed statement from the experimental researches of eminent chemists. They demonstrate that compound substances exist that are chemically alike, but differ in appearance, and differ in all their effects in use. Parian Marble, for instance, and common chalk are called carbonate of lime; they are chemically alike, but unlike in effects. Professor Tyndal says, speaking of the minute shells composing chalk-beds: "These shells are built up of little crystals of calc-spar, and to form these crystals the structural force had to deal with the intangible molecules of carbonate of lime." During all these transitions it was carbonate of lime. And there he rests it as he must. Neither he nor his peers can tell us what vital conditions ensued, when "the intangible molecules" climbed into calc-spar, and this into shells, and these into chalk beds. No chemist on earth has been able to trace the vital processes by which nature fits her soils, and waters, and atmospheres for organic forms in regular gradations. Suppose a farmer sows a pulverised quantity of "the intangible molecules of the carbonate of lime" direct from the rock, and an equal quantity of the crumbled stuff from chalk beds; the former will be inefficient compared with the latter. Let him sow sulphate of lime which is known as Plaster of Paris—a valuable article rightly applied—and an equal weight of sulphate of lime made from bones by treating them with sulphuric acid to render them super-phosphate of lime; for a higher class of plants to which it is best adapted, the latter is a very large per cent. ahead of the former. The great difference in the effects of vegetable growth is not owing to the acid treatment above. Take the dust of phosphate rock which is compared of phosphoric acid and lime, and have the same relative proportions as in the phosphate from the bone, and treat it (that of the rock) with sulphuric acid, and, as before, the bone in comparison leads in nutritive virtue. Our farmers do or ought to know about these facts, yet they, generally, seem perfectly indifferent when they see buffalo bones by the car-load gleaned from the wild prairies and valleys, shipped into the eastern cities, thus robbing our soil of the best possible dressing almost at our doors. Why, the strange antics of a cow ought to waken the farmer to his senses, when she gnaws bones like a dog. She thus teaches him that his soil and thence his crops are deficient in available phosphate of lime. Will he give her the decoction of a powdered phosphate rock, or a bit of bone dust—which? We have a plentiful supply of potash, but, perhaps non-adaptable. If direct from the granite or field par, what is it fit for, except to be ground over and over by the plow and harrow, chrystalized and rechrystalized, pulverized and triturated, and possibly it may then aid in the growing of cereals, preparing the way for fruit plants. Suppose we try, even on the alkali fields, the progressed potashy of wood or grass; that's an improvement; that loves the apple tree and the apple tree courts the favor.

The night soil will produce effects such as are not warranted by its analysis, and such as cannot be imitated by any synthetical arrangement of similar constituents. Experience also demonstrates the other manures of a high class furnish progressed materials that will produce larger and better crops than even greater quantities of like primaries from a lower class.

The same rules obtain in *materia medica*. Prof. Mapes, whose horticultural writings are above all price, calls our attention to an interesting fact practically illustrative of the law under consideration. He says, "For more than a century a medicine has been manufactured in London, known as *Pulvis Jacobi* (James' Powders). For a long time its composition was a secret. The medicine, however, was in general use, and large quantities were annually sent to the East Indies by the East India Company, for the use of its medical department. It was very effective in the treatment of fever, and its action always found to be uniform. The Messrs. James, the original discoverers of this medicine died, and their successors of the same name, from philanthropic motives, made known the composition, and the receipt for its manufacture found its way into the *Pharmacopia*. It was said to be composed of phosphate of lime and oxyd of antimony in certain relative proportions, which were stated. James' Powders were soon manufactured by every apothecary as well as by the immediate successors of the original discoverers. The East India Company advertised for proposals to furnish them with medicines, among which was a large quantity of James' Powders, and a large and respectable manufacturer of London named a lower price for this article than that named by the Messrs. James themselves. It was furnished and sent out. The Medical department reported that it failed entirely to prove the usual results. The company refused to pay the bill, and a suit ensued. Many of the first chemists of England, including one of the Messrs. James, made an analysis of this article, and gave evidence that it was the same composition as that made by the Messrs. James.

It appeared in evidence that the new manufacturers had calcined the phosphate of lime rock from Estramadura, and then combined it with antimony as directed; that the Messrs. James made their medicine by calcining the bones of oxen, and mixing the phosphate so obtained with oxyd of antimony. Every chemist, Mr. James included, believed and stated that there could be no difference in the effect of these two medicines; that after the Estramadura rock was calcined, and the bone was calcined, the results were alike, and the verdict was given in favor of the manufacturers. The company, however, sent out a new quantity manufactured by the Messrs. James, and unlike that made from the Estramadura rock, it was found to be efficient."

This statement of Prof. Mapes clearly shows that men, like plants, can only assimilate such primaries in progressed conditions as are adaptable to their plans of being. It also helps us as to proper mixture and selection of manures; the higher qualities always for the higher grades of plants. Why will the cauliflowers refuse to be sustained in the proper soil for the lichens and mosses? Obviously because the cauliflower is far removed in progression of primaries in its structure from that of the lichens and mosses. The fresh debris from the mountain side may grow the wild, colorless, single rose, but try the progressed rose, a variety which only centuries of culture can develop, so beautiful and sweet, grim death is transformed in its presence into life's opportunity for a higher type of being; rather than be sustained there, its very soul departs, for ought we know, into the angel realm that enshrines all the perfections of nature.

The apple is the best fruit in the world, "the survival of the fittest," the companion of civilization. It was, doubtless, the crowning excellence previous to the records of the Greeks and Romans, previous to the pre-historic lake dwellers of

Switzerland, previous to the migrations of the early Argus. By the slow and unerring law of evolution, through centuries of transplanting, hybridation and fertilizing culture, it has reached its present perfectable condition. Hence, it must have a location, a soil, an atmosphere exactly fitted to its progressed structure and instincts. In the attempt to shelter the apple tree, suppose you plant it in the woods to feed on decayed leaves, locusts and wild honey. What a shriveled, scrubby, lousey thing it is! If it has health enough, bring it forth into the freer light and air, into cottonwood soil where you can love it into life, and see how quick it undergoes a "revival of religion."

Prof. Budd, of the Agricultural College at Ames, Iowa, in his able report on "North of Europe Fruits, Trees and Shrubs," calls our attention to the wonderful success of orcharding in nearly all the provinces of Russia. Speaking of the province of Kazan on the upper waters of the Volga, whose southern boundary is on the 55th parallel of north latitude, he says: "The largest and best orchards are on the lowest bluffs on the west banks of the Volga, or on the dry prairies just back of these bluffs. We found the dwarf-appearing trees loaded with high colored and really good fruit, and we could see scarce a trace of injury by the terrible winters of this latitude." He also informs us that the thermometer there, has often been known to reach fifty-eight degrees below zero. In other provinces of the hyperborean climates of the great empire are found vast orchards of cherries, as well as apples, and pears of the improved varieties. He and his horticultural compatriots were sanguine that root grafts or top-grafts from those hardy Russian sorts would be a pre-eminent success on our western prairies, dating their conclusion on similar dryness of air and rigor of climate, with the odds in our favor, because our soil counterparts that of the Russian plains, with greater natural richness in the main. But the test thus far largely disappoints expectations. While some Russian varieties have proved successful, it is found they are no more so than some of our native productions. We are therefore thrown back again upon our own resources to build our hopes where we must—on primary fitness to insure mastery for the apple and other fruits, over heat and cold, wind and storm.

Russia is an old country. Vegetations, animals, humanities have there lived and died, their bodies rotting and elementally rising again in improved forms; the primates of structure evolutionally progressed. Hence, apples, pears, plums, cherries, apricots are profitably raised there in localities much higher than our own, some of these flourishing where the Sirrocco of the north freezes the ground six, eight, ten, twelve feet. Our prairie soil is new in use; some of it just subduing by the plow. Give us a tenth of the time Russia has had to prepare for such fruits, give us but twenty years more, with closer analysis of soils, with improved fertilizers, with an education working from the school, to the field, and factory, with our forests then grown into paternal protection, with freer brains to think and sweeter hearts to feel, and see if we do not make our prairie lands the fruit Eden of the western continent.

The meeting adjourned till 2 o'clock p. m.

AFTERNOON SESSION.

WEDNESDAY, JANUARY 20, 1886.

The meeting was called to order at 2 o'clock P. M., by President Smith.

The *ad interim*, or District Reports of the Vice-Presidents being in order, the following reports were presented:

REPORT FROM FIRST DISTRICT.

WILD OR NATIVE FRUITS.

By A. W. SLAS, Rochester.

Mr. President:

You will not be surprised when I say that about thirty years ago, nearly all the land in my district was in just that wild state in which the Aborigines had always kept it—abounding in a profusion of wild fruits, of no trifling importance to the pioneer settlers. And thirty short years is too quickly passed for the horticulturists of one district to think of running ahead of "Old Dame Nature," were it possible to give the real value of the wild fruits of this district, (to the settlers,) in dollars and cents. And also in the value of all the cultivated sorts, it would no doubt astonish you to note the balance that would stand in favor of the wildings.

No inconsiderable number of our citizens predicted last spring, that all nature had turned a sort of "winter set" and somehow during the icy operation had managed to kill all the cultivated trees, and also the fruit buds on the wild varieties.

Happily, this proved a great mistake, as subsequent events most clearly demonstrated. The severe, cold winter (perhaps the most severe, since the settlement of the country) was followed by a cool, but seasonable spring and summer, and the result was that we reap one of the best crops of wild fruits known here for several years. This would indicate that "Dame Nature" understands her business, and is more lavish in her gifts than the majority of people are aware of.

The wild plum crop was immense—and many fine varieties among them. Some day we hope to produce from the seed, a native plum that shall astonish the horticultural world. Some of the best named sorts are, De Soto, Rollingstone, Cotterell, Waldron, Weaver, Wild Rose, and Forest Garden. James Berry, Choke Berry, Black Cherry, Red Wing, Black Haw, all bore plentiful crops. Wild Strawberry crop splendid, also Gooseberry, Currants, etc. High-bush Cranberry and Elderberries abundant. The Blueberry is found here, but only to a limited extent.

APPLES.

Some member of this Society remarked a few years ago that "a tree is known by its fruit" and not by the color of its heart-wood. And now it looks as though we might advance a step farther, and say neither is it clearly known by the color of its sap wood; for I can assure you that we produced thousands of bushels of as fine apples as were ever set before a king last year on trees whose wood was badly discolored from pith to bark. The recuperative power of our fruit trees, has taken

us all by surprise. Many orchards in this district bore heavily; prices ruled lower than ever before, and yet were high in proportion to other farm products. Among the common apples the Russians take the lead as to hardness, many of the hybrids stand all right, and a very few of our seedling are looking as well.

As far as I know, no pears were grown the past season.

Plums, splendid crop; cherries, poor crop; grapes, fine crop; leading varieties grown, Concord, Worden, Janesville, Delaware and Rogers Seedlings.

BLACKBERRIES.

We believe the question of blackberry culture is now settled for all future time, and in the same way as that of the strawberry culture. No one expects to grow the strawberry in paying quantities for market without covering the plants in the fall, and the blackberry must be treated in the same way. Keep this constantly in mind and practice, and the delicious blackberry will very soon be as plentiful in our markets as the strawberry. Best varieties of the blackberry, as far as we know, are: Ancient Briton, Snyder, Hoag's Seedling and the Mammoth Dewberry.

STRAWBERRIES.

The strawberry crop is very fine, and prices good, our gardeners are encouraged and will enlarge their beds in the spring.

The irrepressible Crescent Seedling still leads the van. It not only "chokes out grass," but chokes off all new aspirants for unearned honors, keeping the while just a step in advance. Downer's Prolific is still popular, Sharpless the largest, and Cumberland Triumph hard to beat for quality and beauty of proportions. Among the newer sorts the Old Iron-clad, Manchester, Vick and others, are attracting considerable attention.

RASPBERRIES.

Crop splendid. Turner the leading variety, Cuthbert, Brandywine, Sheffer's Colossal, and several others grown to some extent; Marlboro, not fairly tested, but quite promising.

REPORT FROM SECOND DISTRICT.

By VICE-PRESIDENT E. H. S. DARTT, Owatonna.

Mr. President and Members:—

I have been watching with far more than ordinary interest the advent and effects of the exceptionally cold winters of the last few years. And though they have seemed uncomfortably close together and decidedly discouraging in their effects, we have to admit that last winter 1884-85 *beats them all*.

Previous to that our common apple trees such as Fameuse, St. Lawrence, Talman Sweet, Haas, etc., also Wealthy and other Minnesota seedling apples, had been gradually but surely freezing out. Now a clean sweep has been made. The Duchess and possibly a few other Russians which may prove of equal hardness and the despised crab apples, with crosses between the two are all that is left on which to build our hopes for the future. And since the Russians are not all hardy and many are liable to blight, (and the same is true of crab apples) we can readily see that years of experience will be required before our Society can put forth a list or lists that shall prove reliable for all sections of the State.

The Duchess has stood best in high, airy locations, and on northern slopes, whilst in low, sheltered situations it has killed out badly. The Tetofsky seemed as hardy as Duchess till last winter. Now three-fourths of them are dead. The most live trees are found where the land has been the best cultivated, and the most manure has been applied.

Of crab apples I have tried about forty named varieties, besides a large number of seedlings of my own production, and up to the present time I know of hardly a tree that comes up to all the following requirements: hardiness, fruitfulness, size and quality of fruit, longevity and freedom from blight. I think about one-half lack in hardiness and an equal proportion in fruitfulness, and blight hits them all to a greater or less extent, some much more than others. I mention a few varieties:

Transcendent—Liable to blight; supplies our own market nearly every season.

Hyslop—Not a good bearer, sometimes blights; apples second quality; keeps well.

Greenwood and Early Strawberry—Well up on most points; apples do not keep.

Whitney No. 20—Promising; have grown it 8 to 10 years; needs further trial.

Dartt's Hybrid; same.

Maidens Blush—Sprouts badly from bottom; dies young.

Minnesota—Not productive; short lived on sandy land.

Orange—has not borne well; blossoms very frail; killed by slight frost.

Gen. Grant, Conical and Marengo Winter—Not hardy; blight to death.

Beeches Sweet and Hutchinson's Sweet are well up except on fruitfulness.*

I sincerely hope that our Society will in the near future pay more attention to the crab list. For the people want trees that will stay with them and produce a passible fruit in seasonable quantity. They are tired of kinds that come with deceptive, high-sounding names, go with winter's first shock, or linger for a season to prove how uncertain certain things are, and especially Minnesota apple trees.

REPORT FROM THIRD DISTRICT.

By VICE-PRESIDENT M. CUTLER, Sumter.

Mr. President, Ladies and Gentlemen:

Owing to my not receiving last years' report of the Society until late in the season, and my being busily engaged in building, I was not aware of the duties devolving upon me as vice-president until a few weeks since, after having accepted an invitation from our Secretary to contribute a paper for this meeting. Hence my report will not be as complete as it would otherwise have been.

The past year has been one to test the courage of the horticulturists of the Northwest. From every direction come reports of the sad havoc produced among fruit trees and plants. My section of the State has suffered with the rest. All report their standard trees as dead or dying.

Contrary to expectation Transcendent and Hyslop trees came out in pretty good shape last spring, blossomed very full, and bore a large crop. There were so many crab apples in the market that they reached the low price of twenty-five cents a bushel. A few Duchess apples were in the market but no other home grown standard apples. Wild plums were abundant.

One year ago last fall I had as fine a strawberry bed as I ever saw, about one and one-half acres, located on the west side of willow trees. I covered them nicely with marsh hay and hoped for a good crop. But alas my fond hopes were doomed to disappointment, the snow blew off the highest part of the bed, and where it sloped to the Southwest the ground thawed out to the depth of four or five inches during the first days of March, then froze up solid so that most of the plants were killed. Where the slope was to the Northwest and on the low land, Crescents and Glendales were in fair condition, but Old Iron-clad, Bidwell and Pipers were nearly extinct. Manchester, James Vick and Jumbo were about half killed. Manchester and Jumbo produced some large berries, and James Vick a few small ones.

Crescents proved as usual with us, the boss of all, for wherever a plant had life enough to live, we found nice berries whether in weeds four feet high, or where the ground was clean. Some have said they were too soft for a market berry, I shipped them to Fargo and Aberdeen, Dak., and although some were dead ripe when picked, they were reported to be in fine condition, and were sold at good prices.

I copy the following from *Rural New Yorker*, from a Michigan correspondent. "Sharpless sold in the Chicago market for \$1.75 to \$2.75 per 16 qt. case; Crescents 90 cts. to \$1.75, while Wilsons sold for 25 to 40 cts. Total expense of picking, crates, etc., 45 cents per case." You can easily figure out which paid a profit. The same writer states that the Crescents yielded much the largest crop.

I gathered 2,300 quarts, 500 being from my old bed, which sold for 12½ cts. per quart. The crop would have been better but for drought and hot weather in June, which nearly cooked vines and berries. As far as I have been able to learn, berries grown on the east side of trees where covered with snow, came out in good condition.

Turner raspberries came out all right and bore a good crop. Cuthbert in fair condition for newly set plants. I have come to the conclusion that to get a crop of blackberries they must be covered, and that those most productive and of the best quality should be set.

Grapes do fairly well where properly cared for, but on account of frost none but the earliest kinds should be set on the prairie. One of our members, Mr. Nobles, had some very fine Concord grapes which he exhibited at our County fair.

The display of fruits and vegetables at our County fair was not very extensive, not because they are not grown, but because horse-racing and gambling games are made such a prominent feature that few respectable farmers will exhibit their products. When they see fifty cents offered for the best plate of grapes, and \$100 offered to the owner of the fastest trotting horse, their exhibition ardor gets so cold that it never thaws out. When the people see their hard earned dollars spent in fixing up costly race tracks, great amphitheaters, and elegant barns for the accommodation of a few horse jockeys and gamblers, and the great agricultural staples of the State shoved off into a temporary shed, it is time to cry a halt. We have often been told that a fair could not succeed without horse-racing, but the Dakota County farmers have proved the contrary, and I hope other fair associations will follow their example. Mr. Ditus Day, of Farmington, writes me as follows: "We had no racing at our fair last fall, and all that I have spoken to admit that it was the best fair we ever held, and we had plenty of money to pay premiums, for the fast horses did not carry it all off, as has been the case sometimes before."

In regard to fruits Mr. Day writes as follows: "Strawberries were a good crop; Crescents did the best, and Green's Prolific did well. Delaware, Concord and Janesville grapes did well." He likes the Delaware the best of all.

The Turner raspberry stands the winter first rate and bears a good crop. Berries brought 10 to 15 cts. in our market, and grapes 8 to 15 cts. per lb.

Duchess apple trees were but little injured last winter, and bore a good crop.

I append the following report from Mr. Crandall, one of our leading fruit growers.

FRUIT REPORT FROM McLEOD COUNTY.

M. Cutler, Vice-President Minnesota Horticultural Society.

DEAR SIR:—In answer to your inquiries after fruit culture I give the following:

(1.) "Give age and description of seedling apple, comparing leaf and body of tree with other apple trees, also condition last Spring."

Ans. I have some fifteen or twenty Duchess seedlings five years old of which one is a promising, thrifty tree but has not blossomed yet. It is tall and straight, and if the fruit should prove good, would make good nursery stock. The leaf resembles the Duchess very much, with perhaps a little resemblance to the Transcendent. Some of these seedlings are of very slow growth. Others have been set back by the green aphids, but have done better this season than ever before and may become thrifty. None of these Duchess seedlings have ever winter-killed, not even affected by last winter's extremes. Seedlings from Russets and Willowtwigs froze down every winter as long as their roots lived.

Last year all of my standard apples black-hearted or killed out entirely except Duchess. The Crabs came through in fair condition, except some young Transcendents, which black-hearted. Whitney No. 20, Early Strawberry, and Hyslop showed no signs of black-heart.

(2.) "How many kinds of strawberries have you, and what was their condition last spring? Which stood the drought and yielded the best?"

Ans. Over twenty kinds, besides seedlings. All were covered last winter with marsh hay as usual. Great American, Mount Vernon, Bidwell, Old Iron-clad, and Glendale, a part of Crescents, Sharpless and Cinderilla, were protected by snow through the March thawing and freezing, and were in good condition in the spring; those not protected by snow except seedlings and Parks Beauty were from one-fifth to four-fifths killed by freezing and thawing.

Considering the quantity of ground occupied, and the lack of mulching to keep the soil moist, I think the Parks Beauty stood the drought and the winter the best and bore the heaviest crop. I think the Parks Beauty is not the same as Crescent, but it is very much like it with renewed life and vigor.

Pipers Seedling and Kentucky stood the winter as well as the Crescent, and better than Captain Jack, Wilson, Warren, Big Bob, Cinderilla, Longfellow, and some twenty other kinds.

(3.) "What can you say about your seedling strawberries?"

Ans. They were not protected by snow and were not winter-killed. About a dozen from Crescent and Sharpless, Crescent and Capt. Jack, and Sharpless and Capt. Jack produced the finest berries on my place. There were more pistillates than perfect blossoms and generally the pistillates were larger than the hermaphro

dites, but not quite as fine flavor. The plants were nearly all strong growers with thick, heavy foliage resembling the Sharpless while the berries had the peculiar yellow seeds of the Captain Jack. I can't give a particular description of any one as my memorandum has been mislaid. I have a large number to come into bearing next summer that did not fruit this year. Not one of the large number of seedlings from the Great American bore any resemblance to their parents. One seedling from the Cinderilla was of fair size and flavor, but in neither quality equal to the parent stock.

(4.) "What do you consider the best raspberries for prairie cultivation; give experience?"

Ans. After six years experience I find Turners red decidedly the best on the prairies. Philadelphia winter-kills more, is softer, smaller and less productive. Brandywine is hardy, but is small and yields but little. I have not tested any good Black-caps yet. Purple-cane and its seedlings are hardy but too small. Gregg freezes down every fall. I am now trying Tyler and another Blackcap; have some hope of them.

(5.) "What kinds of grapes do the best with you?"

Ans. As yet the Salem; but the Worden, Moore's Early, Concord and Brighton may do as well after a full trial. Clinton does not pay for the trouble of covering it in winter. Worden is sweeter and thinner skinned than Salem, and Brighton is a ranker grower. Salem is the best of these and the best keeper. It has always ripened here except in 1884, when we had practically nine months winter, and nothing got ripe that season.

(6.) "What can you say about blackberries?"

Ans. I have had no success with them yet. They all freeze down to snow line. Snyder and Taylor's are not worth bothering with any more. Will try two other kinds that I have and one or two kinds of Dewberries, and perhaps some seedlings.

Yours with respect,

E. CRANDALL.

Sumter, Minn., Dec. 1885.

REPORT FROM FOURTH DISTRICT.

By VICE-PRESIDENT, F. G. GOULD, Excelsior.

The experiments of the early settlers of Minnesota in growing fruit resulted usually in utter failure. The day of small fruits had not yet fully arrived, and it came to be a common saying that fruit could not be grown in Minnesota. This supposed fact was considered the greatest drawback to the settlement. While the healthfulness of the climate, and productiveness of the soil were satisfactory, it would do to endure but was not good enough to live in.

About twenty years ago the Duchess apple and Transcendent crab came into notice and soon after the Wealthy apple. About this time the Delaware and Concord grapes began to attract attention all over the country, and we may as well make the year 1866 or thereabouts the date from which we started on a more hopeful prospect in fruit growing. To be sure a few fine strawberries had been grown, a few grapes had been tried. Those of the latter, of most value, were the Isabella

and Catawaba, both late in ripening but answered the purpose of demonstrating the possibilities of grape culture.

All will admit that the orchard and fruit garden add much to the enjoyment of farm life, especially with the children. How many of us have in dreams in later years lived over again the scenes of our childhood and the happiest of all were, those when we were the first in the orchard in the early morning to gather the first fruits which had fallen during the night.

I could not advise the planting of extensive orchards of the apple, but I would recommend the planting of a few trees of the apple or crabs on every farm, even without a fair prospect of making a profit out of them. I believe this to be the duty of every owner of a farm. Children relish the Transcendent crab; it is the best medicine for them, and another thing, when boys have fruits at home they will escape somewhat of the temptation to appropriate that which belongs to others.

A larger list of desirable fruits can be grown in Minnesota and Dakota than in the extreme Southern states of the Union. My attention was called to this fact last winter at New Orleans by residents of that section. To be sure they have there oranges, figs and cherries, and that about completes the list, except the shell fruits.

Wild strawberries and red raspberries were quite plentiful last season in the vicinity of Turtle mountain and Lake Minnewaken in Northern Dakota.

Chokecherries of the best quality I ever tasted grow in the greatest abundance in the so-called "bad lands," in Dakota.

Strawberries and raspberries are among the most valuable of fruits. Currants, gooseberries and the native plums are desirable also. They can all be successfully grown all over Minnesota and Dakota.

The grape can be profitably grown only in favored localities but in such locations where good varieties have been planted and properly cared for they have returned a greater profit than any other crop grown.

The timbered portions of the Northwest are the most congenial to nearly all kinds of fruit. Some kinds succeed best on northerly slopes; among these I will name apples, raspberries, strawberries and blackberries. The selection of varieties is the most important step in the business. Unlike most other things the higher priced are generally of the least value to the planter. At present there are many new and untried kinds of fruit plants offered to the public; possibly some of them may have some merit, but I would suggest touching these new things lightly, for if they prove worthy they can be secured later at a moderate price.

I will name some of the varieties of the different fruits which I consider the most desirable for planting over the greatest range of country. Of the apple family I will name the Transcendent crab. This sort can be depended upon to yield more fruit than any of its kind.

The Turner raspberry is the hardiest of all known sorts. Where it will not succeed, I doubt if it is much use to try any other. The quality of the fruit is as good as the best. If it was as prolific as the Philadelphia (which exceeds all others in this particular) it would stand very much above all others.

The Wilson Strawberry is the best for general cultivation though it does not always do well on sandy or light soils. It requires care in the growing season and protection over winter.

Among the blackcaps I will name the Doolittle and Seneca. None of the blacks

can be relied upon on the prairies west of us. Currants, the Red Dutch; gooseberries, Houghton; grapes, the Concord and Delaware with a very promising candidate in the Moore's Early. I think the Snyder and Ancient Briton blackberry are giving as good satisfaction as any at present, but are liable to winter-kill unless protected by laying down.

The cultivation of the apple is an up-hill business, as the hardest known trees are either killed outright or severely crippled as often as once in every ten or twelve years. The question as to what killed the trees has been pretty thoroughly gone over. The fact that the most disastrous years were those when the mercury found a resting place down in the forties has convinced me that the extreme cold weather has much to do with it.

Mr. Gould. Mr. President, I have to report, in common with others, injury to nearly all kinds of apple trees by the severe winter of last year. Some varieties, the Duchess and others, had life enough to blossom more or less; some of them set some fruit, but nothing to amount to anything, excepting the Duchess and Wealthy, of the large apples. It is the case quite generally in our neighborhood, and I don't know of any place where trees have shown more injury any year since the winter of 1874 and 1875 than last year.

Generally, good crops of strawberries have been raised. We have found the snow a good protection. In the timber districts the Philadelphia raspberry bore a good crop generally. On the prairie, in some places, it was killed quite badly. I think the Philadelphia will bear more berries than any other known sort in the Northwest; it will bear a good many more where it will stand the winters. The Turner is hardier, however, so far as my observation goes; I think it is the hardest raspberry we have. None of the blackcaps are as hardy as the Philadelphia, and not near as hardy as the Turner. An ordinary winter will kill the blackcaps on the prairies most anywhere, more or less, and I consider the blackcaps utterly worthless beyond the Big Woods west of here, unless they are covered. The price of strawberries was lower last year than it has been for six or seven years, I think.

A Member. What was the average price?

Mr. Gould. Well, I think the price did not average eight cents a quart last year. I have been growing for the market, more or less—not in very large quantities, however—for fifteen or sixteen years. Year before last I estimated my crop at an average of about ten cents a quart; it might have been as low as eight; but I am satisfied that last year the price was lower than ever before.

Col. Stevens. I understood Mr. Pearce's crop averaged twelve cents.

Mr. Gould. I presume he is a better salesman than I am.

Col. Stevens. Can you raise strawberries at eight cents with any reasonable profit?

Mr. Gould. Oh, yes; that is better business than growing wheat, a good deal. They can be grown profitably at from five to six cents per quart; two cents on a quart is a pretty good profit. I am speaking, of course, of the wholesale price.

Plums were plentiful in this part of the State, so much so that everybody could have a share even if they had but little money to buy, and a good many could have them without money.

Currants and gooseberries were, perhaps, not a big crop, but there was a fair crop of currants. Gooseberries are not raised here very extensively, but the Houghton, as far as I noticed, were a fair crop.

REPORT FROM FIFTH DISTRICT.

By VICE PRESIDENT G. W. FULLER, Litchfield.

Mr. President :

I have no written report, and I will be very brief. I am sixty-eight miles west of this city, on the St. Paul & Manitoba road, five miles beyond the Big Woods, on the prairie. We had a year ago quite a fine crop of Wealthy and Duchess apples. This last year the only apples we had, to amount to anything, were the Transcendents. The Wealthy trees, not only my own orchard, but as far as I know all through that section of country, with very few exceptions, were killed. I have a few very poor trees still surviving. The Transcendents, however, done the best the past year they have done for years, and have produced a fine crop. Hyslops were a failure. I had a pretty good crop of Early Strawberry. The trees are in fair condition.

Our currant crop was very fair; mine was as good, probably, as I ever had. I have the white and red varieties. I do not think there is any better variety for our section than the Victor.

Of raspberries, of course the Turner is the best with us. I have the Philadelphia, but shall allow them to run out. The Cuthberts I set a year ago last spring, but the bushes were killed down last spring. I don't regard them worth raising,—that is, unless we can succeed by covering.

Blackberries, as I have already stated, are of no value with us unless covered. We raise the Doolittle blackcaps there, getting a very good crop of berries from the new shoots that come up in the spring. I

keep all my raspberry bushes down low by pinching them off when they get up two or two and a half feet; I pinch them back and keep them low in that shape.

Strawberries were very good the past year. I raised the Crescent and Charles Downing. The Glendale I do not regard as worth raising. I have had them, and they do very well to fill up a quart box, but are good for nothing else with me. The Sharpless failed by reason of frost in the early spring. The year previous, however, I had a very fine crop.

As to grapes, I would report that I have the Janesville; have not given it a long enough trial to say what it is really going to do; I doubt about its being successful. I have several other varieties. The crop, was very good, and I sold none of mine for less than fifteen cents a quart; that is the wholesale price. The retail price during the whole season nearly was twenty cents. Of course, we don't send them down to Minneapolis; we sell them at our own place and send them west.

The Cherry currant I have never raised successfully. I have had them for ten years, and every year it would die down. I regard it as entirely worthless in our locality.

Mr. Kellogg. We have about ten papers that want about ten hours' discussion. We left off this morning and promised to take up, first, the unfinished question about grafts, about their treatment and growth, how farmers could use them, and the profit that could be made from root grafting, etc. We have had presented the subjects of hot and cold locations for trees and plants, seedlings, new plants, propagation of small fruits, fungi, wild fruits, Russian fruits, and grapes in all their varieties; raspberries, blackberries and strawberries, in all their varieties; two varieties of dew-plants; winter-protection, cross-breeding, tree culture as adapted to northwestern prairies, and lastly, that never-ending question of blight. [Laughter.] I don't see any hope of touching them all.

The report of the committee on Russian apples being called for, Mr. Cutler in presenting the report stated that owing to the limited time the committee had had to inquire as to the merits of the different kinds of Russian apples, and their non-acquaintance with the quality of many of them, they had deemed it best to select only such as have been grown in Minnesota, those that are of good enough quality to pay for growing; that the committee had to take the evidence of their own number to some extent, that had propagated these different kinds of apples.

RUSSIAN APPLES RECOMMENDED.

We the undersigned committee appointed to report six Russian apples for general cultivation report the following:

Ostrekoﬀ's Glass, No. 472.

Hibernal, No. 378.

Red-cheeked apple, No. 445.

Red Anise, No. 985.

White Pigeon, No. 317.

Autumn Streaked, No. 964.

Respectfully submitted,

ANDREW PETERSON,

M. J. HOAG,

M. CUTLER.

Mr. Smith. I move that the varieties named be recommended for trial rather than for general cultivation.

Mr. Tuttle. Mr. President, I think that is a proper thing to do with all these Russians, for some time, at least. We will find probably a good many just as valuable and some a good deal more valuable than those on the list.

Mr. Sias. I am in favor of the motion. I would ask Mr. Cutler and other members of the committee if they are willing to accept that amendment.

Mr. Cutler. Yes, sir; I have no objection. I think that is best.

The motion was carried by sixteen in favor and none against.

DISCUSSION.

Mr. Kellogg. We stopped in the discussion of root grafts, after we had got them planted, I believe. Upon that subject I want to say that if it is designed for the farmer's use, I believe it to be the most profitable way you can grow an orchard, to set out the trees when not more than seven inches long; set with a stake on the south side. If you take half as much care in growing your orchard as you do your calves you will have apples, and plenty of them. The tree should never be transplanted from the place where it is first set. After setting there should be clean culture until the first of July, then let the ground go to grass. I don't want any late cultivation, either in a nursery or in the orchard. It is better to put two grafts in a hill so as to be able to take one up if necessary; if one dies you have a chance for another. Give them clean culture, and keep everything out except the horse that draws the cultivator. Let your graft occupy the place of a hill of corn.

Mr. Sias. About twenty years ago I advocated that same doctrine. I went to selling root grafts, and I only found one man that succeeded with them. He is not a nurseryman, and never has been, but is one of the best practical gardeners I ever knew. He watched them, took care of them, and from those root grafts he had a splendid orchard. He had eastern varieties from Rochester, N. Y. And he was the only man I ever knew that succeeded. Farmers, as a rule, will not take care of plants; they neglect them when they are small. They only have to neglect them for a single year in order to have them die. If we could "make over," the farmers then it would be all right; but it seems to me, as we have to take things as they are, that it is better for the nurserymen to nurse the plants until they get to be three or four years old. The farmers have succeeded with that class of trees the best.

Mr. Tuttle. I have seen both methods practiced, and I can't see any difference—not a particle. As to cultivating, we used to think, a few years ago, that we must cultivate the fore part of the season, and then leave the trees growing in the grass. That was when we didn't grow Russians. We can cultivate the Russian apple; I find no difficulty, neither in the yearlings nor in the others. There is no trouble with the Russian apples from late cultivation.

I have never had any trouble from root-killing in the orchard; if I did, I would mulch the trees. The trees that were mulched on sandy land in 1872 and 1873 came through all right. If I was setting an orchard on sand I would mulch the trees in the fall, always throwing dirt around them. Your trees would always be secure in the sand; hard soil freezes much deeper and harder than lighter and more porous soil, especially if you get on gravel. Freezing will kill anything. Any kind of mulching will prevent excessive freezing. I have examined orchards where nearly every tree was killed,—an orchard set thirty-five years ago, and on quite sandy land. The trees had gotten to be of considerable size, and finally nearly all of them died, and sprouts were coming from the roots.

It has been a pet theory that we must take the crab in order to get good roots; but we have found that the crab is not fit to graft a common apple on to, either in the top or root. I would like to use crab grafts if they were of any value. I had but very few apples last fall, I ground up some of my crab apples for cider, and piled up the pomace. I should very much have liked to wash out the seeds for planting, but I had tried it and knew it to be worse than worthless.

A Member. Couldn't you use the seeds of the Transcendent for root grafts?

Mr. Tuttle. No; I could have washed out \$20 worth of seeds in a day, but I have seen enough to satisfy me that it is the worst thing we can get.

Mr. Smith. I have seen Transcendent roots used, and I never could see any difference between them and others, when the trees were dug up two or three years afterwards. I could see nothing in the growth of the trees for two or three years that militated against them.

Mr. Tuttle. Well, the difference comes after that. I have seen trees set of the Duchess and Fameuse, grafted on crab stock. Those trees were perfectly worthless as orchard trees; they were scraggy and of no account. It don't make any difference whether you graft in the top or the bottom. I have grafted on the common crab, on the old Transcendent, on the large, the yellow, and the common, and have never found a tree yet that was worth anything as an apple tree, grown upon crab stock. I grafted ten thousand Tetofsky on Transcendent crabs, and those trees proved to be perfectly worthless. Of that ten thousand there isn't, I think, a stem alive in the Tetofsky above the ground—not one.

Mr. Cutler. I would like to ask what kind you consider the best?

Mr. Tuttle. I have been in the habit of recommending the Fameuse. I have been experimenting with a quantity of seedlings. Some of them I have great hopes of, but there isn't one of them that I would recommend for propagation to-day, because they haven't had trial enough. I have apples other than the Fameuse that appear to be No. 1 in hardness and quality, and yet I would not dare to recommend them. We have had apples which were recommended a few years ago in Wisconsin, which were said to be just what we wanted; men have gone and planted thousands of those trees; if those trees had stood and proved to be hardy, they would have made orchards that would to-day be worth thousands of dollars. I planted five hundred of them and don't consider them now worth anything. We don't dare to recommend these seedlings; it takes years of trial to fully test them. Understand me, I don't object to men planting seedlings; I don't care how many. I am planting lots of them myself, but I say it takes years to test them, and I don't expect to live long enough to see a seedling that is thoroughly tested in Wisconsin; and yet, I would not discourage anybody from planting them. There may be something that will come from it; we have been working for twenty years and we haven't got much of anything we can depend upon now. The seedlings of Mr. Gideon, crossed with the crab, undoubtedly are as valuable as anything

we have. I have seedlings crossed with the crab, sweet and sour, very nice ones, but still we can never make the crab apple take the place of the common apple as a market apple. You may raise all the crabs you wish, and no matter how good the quality, people will buy their apples from the Baldwins and Greenings.

Mr. Smith. Somebody said there wasn't any difference whether you planted root grafts or transplanted them when two or three years old. That is a question that is of importance to farmers, and I think there is a vast difference if grown by them; I think Mr. Kellogg's views are correct. A good root graft is worth in the market about one cent put up in good condition. Farmers throughout this State have been paying twenty-five cents up to a dollar apiece for trees that were not worth as much for them to plant as the root grafts would be. Many of them, if they knew how to plant root grafts would do it, their boys would do it, and I think it is very important for the best interests of farmers that this question should be thoroughly answered. Now, in regard to tying, the nicest thing to use is to unravel an old stocking leg and use the yarn. One end of the yarn is fastened at the top of the graft and then wound around. Mr. Sias says they will all die. They fail of course, from careless handling, and you have to handle them more carefully than you do eggs. If you break them apart after they have been knit together, they are very likely never to unite again. The ground should be worked at least two inches deeper than you expect to set the plants.

Another reason why farmers do not make a success with root grafts, is that nine times out of ten they take the plants out under a burning sun into a warm place and set them out; they may be exposed perhaps for two hours to a hot sun where the heat is so intense that perhaps ten minutes' exposure will turn them brown. If I were to advise how to handle grafts I would recommend to take them to the cellar, into the shade, or to the north side of the house, without allowing the sun to shine or the wind to blow on them; careful handling will insure success. I verily believe that to get an orchard cheaply and surely it would be better for a man to get these root grafts than to set three and four year old trees.

Mr. Pearce. I have no objection to the farmers setting out root grafts, but there is objection to setting them out in the orchard at once. If they will take the root grafts and set them out in rows and cultivate them, they will soon have them ready for transplanting, and will succeed in growing them. I can see no objections to farmers setting out root grafts if they will take care of them.

Mr. Sias. Fine spun theory is one thing, and practice another. I live at Rochester, about fifty miles from any large body of water, and I am satisfied that if I had set my orchard in the start that way, I should never have succeeded in keeping my trees alive. I am on a high, northern slope, which is naturally, I think, too dry for an orchard, and if I had set root grafts in there, (unless I had cultivated it right along every week as they do the root grafts), I am sure that I would have lost every tree in my orchard. Perhaps these root grafts may be set on the shore of some lake, and with half the cultivation that would be necessary in my locality, they might succeed, but to recommend the practice generally to farmers, to plant out trees in that way, would be decidedly wrong; why, I think I would insure more than two-thirds of them to die. It has been tried; it is no new thing, and has proven a perfect failure, as a general thing.

Mr. Busse. I don't think farmers should buy trees less than two years old at least. I have been out west and seen a good many orchards, of trees four or five feet in height. In times of haying and harvesting the grass was about as high as the trees. A great many plant them all right and say "I am going to have an orchard and take care of it," but the time comes when their work presses and they neglect the trees; the consequence is that if the trees live through the first year, they are sure to die the next. These root grafts will not grow if you don't take care of them; the farmer don't do it, and it is better not to recommend them. They should not have the trees before they are two years old, because if you give them grafts, they never will get an orchard at all; that is the opinion I have of it.

Mr. Cutler. I would like to ask Mr. Tuttle how long he would leave the trees in the nursery before transplanting?

Mr. Tuttle. That depends a good deal on the variety. Some trees will do first rate transplanted when they are five, six, or seven years old. I set out in rows three hundred Duchess trees, five or six years old and never lost a tree; there were three of them killed last winter. But there are other trees that it is better to set when they are two years old. We don't calculate to sell a great many two year olds, but in setting them we do it without trimming; we find that trimming is not good for them. It was practiced generally thirty years ago, but I don't know of a practical pomologist in Wisconsin that would recommend it to-day. I set out fourteen or fifteen Seek-no-further; four of them did not survive the first winter. They came from Rochester, N. Y., and according to the ideas I have always had,

I thought they were about worthless, and so they proved to be, for there are but two or three out of the lot left. I set out fifty Golden Russets; they came on and bore. I lost twelve of these trees in a storm, but they came up again from the ground.

Mr. Brimhall. I think it would be better to recommend to farmers to buy two year old trees.

President Smith. This question seems to have been pretty thoroughly discussed; it has had about an hour and a half.

Mr. Kellogg. Mr. Tuttle has sprung another question on us, as to the formation of trees, and the height of the top; that will take another hour's discussion; we shall never get back to where we started. But before leaving this question of root grafts, I will say that I think the very fact that farmers won't take care of them is no reason why it is not the best way to grow an orchard. There must be thorough cultivation, of course; it is only neglect that kills them, still they don't require any more attention than a farmer gives his calves. How long would a calf continue to grow if you didn't feed him night and morning?

Mr. Sias. One thing more. Farmers never set their trees deep enough, if they set them with a dibble. They ought to set them with a spade. I have been practicing setting with a spade the last two or three years, digging holes four feet deep and four feet wide, digging them in the fall, and find my trees have been doing better, by this plan of getting the roots lower down; if trees are set with a dibble the roots will be covered so shallow, right where they want to extend, they will dry up. The dirt should be stirred deeply.

Mr. Smith. I want to ask what good two year old trees, as they come from the nursery, are worth; what would be a fair price for them? I think nine-tenths of the farmers are paying three and four dollars a dozen when they would not take care of root grafts.

Mr. Sias. I have no objections to telling what I am selling my trees for. I sell any number under fifty of my best Russian varieties at twenty-five cents apiece.

Mr. Smith. Two years old?

Mr. Sias. From two to four years old; anything two years old or anything above that age; we have been selling for years at those prices. If they take fifty trees or upwards, the price is twenty cents. If they go much higher than that it is still lower.

Mr. Tuttle. In selling in small lots, of course the price would vary; some varieties are worth more than others; twenty or twenty-five cents is our price for trees when a man sends a small order.

Mr. Smith. That would be a fair price for two year old trees!

Mr. Tuttle. If a man gets a good tree, it is really cheap if it costs him half a dollar to a dollar; if he gets a tree that won't live, it is dear at any price. I can afford to grow Russian trees cheaper than I can natives, cheaper than I can grow the Wealthy, for the reason that a tree that will grow right along is worth more than a poor one and we can afford to pay more for it.

Mr. Smith. But as a general proposition if a man asks fifty cents apiece for his trees, you would set him down as a humbug, wouldn't you?

Mr. Tuttle. Yes, I would; and a man that buys his trees for five cents apiece and sells them for a dollar and a half is a thief. [Laughter and applause.]

People that set out these small trees don't realize and think at that time that the roots of those trees require a large amount of good soil in order to make them grow. A tree that will bear six barrels of apples must have plenty of room for its roots to extend. I have seen an orchard raised on what was called pine land in the East. The owner was told that he couldn't raise an orchard there; but he said he would have a good orchard by planting the seed. He had the ground prepared the same as you would to set an elm tree, taking a great deal of pains, and setting out a large orchard. The result was that some thirty years after that he raised hundreds of barrels of apples on that sandy land.

Now, in planting apples on our prairies we need to dig down at least two feet where the roots will have to extend; you then come to a hardpan; if you dig it out and set the trees they will grow; but you must know what the roots have got to feed upon and give them a chance.

One thing more. Setting trees in the fall of the year, apple-trees, elms or anything else, is usually a failure. We have had elms set in the fall, and three out of four died the next season. Why? Because the dirt that was put around the roots was loose, so much so that the frost came down and froze them and they became just as dry as if they were burned. If you set a tree in the fall of the year wet the roots thoroughly; if you keep them wet until the spring frost is out it will live; if you do not, it will certainly die.

Mr. Harris. Mr. President, Prof. A. B. Seymour is present, and has prepared a lecture upon Grape Rot, Pear Blight, Diseases of Strawberries, etc., and may not have time to give it in full this evening, as he desires to return to Madison by the evening train which leaves at 8

o'clock; therefore, I suggest that we call him forward to address the Society at this time.

The motion was carried.

Prof. Seymour then came forward with a number of charts, much enlarged, which were hung up in front in full view, and were used by the Professor in illustrating his remarks before the Society.

Prof. Seymour. I have nothing especially new to offer, and did not expect to give anything that should go into print, but at the request of your Secretary I have consented to give some points on the subjects of Fungus Diseases of Plants; and I would be pleased to receive any practical suggestions from you that we may be mutually benefited by the discussion.

STRAWBERRY DISEASES.

The subject of Strawberry Diseases has been treated by Mr. F. S. Earle and Prof. Wm. Trelease has also treated the subject very thoroughly. Mr. Earle has found ten species of fungi on strawberries. Five of these were species that had never been observed before. Of the ten he finds only about three are specially injurious. White Rust, (*Ramularia Tuslanei*) is especially destructive and is quite common all over this country, as well as in Europe, where it has been known for many years. Its first appearance on the leaf is seen in little red spots. As those grow older and larger, they become brown, or it may be white, and covered with threads that come through the leaf. This red color comes from a red fluid in the outer cells of the leaf. Mr. Earle finds it to be especially destructive to plants in the latter part of the season, and is more destructive then than at any other time, especially during the fruiting season and afterwards. In the fall the plants have sometimes been found to be so badly diseased as to be almost worthless. The heavy fruiting of the strawberry vines seems to have a good deal to do with the disease. It might seem at first that the fungi are caused by over-fruiting, but I do not think it can be properly said that over-fruiting is the cause of the disease. A man weakened by exposure is more susceptible to disease than if perfectly healthy, but if he takes the small pox or typhoid fever it is because he is perhaps more susceptible to the germs of the disease than another who is subject to the same exposure and does not contract the disease. If the germs are absent he will not contract the disease in any case. If they are present they will have a better chance to work in the weakened condition of the system. And with the strawberry, in the over-fruiting, the plant is exhausted, and if the fungus germ is present it is more

susceptible to injury by it than the vigorous plant; but in the absence of the fungus there is no disease.

Mr. Earle believes that the damage to southern plantations is greater than in more northern regions. (The structure of these fungi was here explained from the chart.)

The fungus grows within the strawberry leaf and sends out threads through the breathing pores on the under surface. The threads bear the germs or spores.

Whether the germs can live over winter or not is still a question. If not the fungus must be carried over winter in some other way. There is another form of this fungus that lives over winter. Many fungi have two forms; one that develops in the summer and will not live over winter; another form lives till spring. In the wheat rust these are known as the yellow and black rust. The yellow will live but a short time, while the spores of the black rust will live over winter. In Europe there is a form of the strawberry fungus not found in this country, that lives over winter.

In this country, minute but dense masses of fungus tissue are found which live over winter and send out spores, bearing threads in the spring, just like those that make white spots in the summer. Within these dense masses Mr. Earle has found indications of the formation of spores after the manner of those found in Europe. You may know better than I do of some varieties of strawberries being affected by this fungus disease, while some varieties are entirely free from it. You may perhaps have found some specially efficacious remedy. Mr. Earle has found that dusting the vines with lime before the maturity of the fruit helps a good deal. Then, after fruiting, another way is to mow the old leaves down—just go over the vines with a scythe and mow down the leaves of the plants. These leaves that are cut off ought to be destroyed in order to prevent the spores living over winter. But if the bed is very badly diseased it may as well be plowed up. Mr. Earle has obtained good results by mulching with straw.

The Black Rust (*Gloeosporium patenilleae*) begins with red spots as the White Rust does, but it soon develops a different appearance. It is most injurious to young plants and has destroyed some newly planted fields. It attacks Manchester badly.

A Member. I would like to ask the Professor if he can tell us anything about the leaf-roller.

Prof. Seymour. That is an insect. I have paid very little attention to the subject of insects and I will have to refer you to some one who

has made a speciality of the study of insects that are destructive to plants. Prof. Forbes has done a good deal of work on the insects which are injurious to the strawberry, and I can refer you to his reports, the Illinois Entomologist Reports.

Mr. Tuttle. We have always considered the rust that Prof. Seymour speaks of as being due to heat and sun-scald; I noticed two or three years ago that we had very moist weather in the spring and that the rust seemed to increase very much; and then when the weather became dry and the rust appeared to stop, the vines took a new start. This led me to think that the injury was not from sun-scalding, as then the rust seemed to abate.

Mr. Cutler. I never saw any rust on my vines until I got the Manchester, and they rusted very badly. Last summer, the season was comparatively dry and I was not troubled with it. It spread among the Manchesters, but I did not observe it on other varieties; I noticed the leaves were covered with dark spots.

Prof. Seymour. Probably that was the black spot rust that Mr. Earle found so destructive.

Mr. Pearce. How do those spores circulate, in the air?

Prof. Seymour. Yes, they are very easily carried in the air, as they are very light. In fact they are more easily carried in the air than ordinary dust.

A Member. I would like to know how they are produced, or how they germinate?

Prof. Seymour. They need moisture to germinate. They germinate by sending out a slender thread, and if they are on the surface of a strawberry leaf, they penetrate into it.

A Member. Do they multiply rapidly?

Prof. Seymour. Yes, sir; quite rapidly. There would be a large number of the spore bearing threads on each spot, and each thread bears a spore on the end. The number is so great that one couldn't count the spores; all of these produce an infinite number of spores.

A Member. Then I would understand that the air would be literally filled with these spores that are sent off?

Prof. Seymour. If they lived on indefinitely that would be true, but they probably do not. Probably after a length of time they would not germinate. After they have been dry a few days it is known they would not germinate.

A Member. I would like to ask if there is any relation between fire blight and rust?

Prof. Seymour. No, sir; I shall have something to say about blight later.

Mr. Pearce. I would like to inquire in regard to the different varieties that it affects,—is it more extensive on one variety than another?

Prof. Seymour. It is said to be. I am not a cultivator myself, and cannot speak from experience; but Mr. Earle has observed that very carefully, and if you will read his papers I think you will find some reference to that matter. I think you will find them in the reports of the Mississippi Valley Horticultural Society.

Mr. Fuller. In regard to that, I would say that I have raised about fifteen kinds of strawberries. I find that the Jersey Queen is most affected. I have never noticed it on the Wilsons, Crescent or Green Prolific. On the Jersey Queen it spread over a distance of about four square rods.

Mr. Harris. I found it on the Charles Downing, but it was worse on the Manchester than upon any other variety. I would like to ask Prof. Seymour if the application of sulphur would be effectual in destroying the fungi.

Prof. Seymour. Very likely, I don't know as that has been tried, but I should think it might be effectual.

GRAPE DISEASES.

There are several fungi affecting the grape that are known as grape rot, and the subject is a very large one; here are eighteen fungi affecting the grape berry. In this country probably more than one are called Black Rot. One of these is *Phoma uvaecola*, B & C. It causes the berries to dry up and fall off. Spore cases occur in black patches and contain a great many minute spores. The other one which has been called Black Rot has instead of spore cases, short threads in bunches that stand out on the leaf or bear the spores.

The American grape Mildew grows on the berries, but we find it oftener on the leaves. Brown spots, discolored by the action of the fungus, appear on the upper surface of the leaves. Opposite these on the under surface are patches of white; under the microscope, these are seen to be branching threads bearing a spore at the top of each branch. Within the leaf the fungus grows and special branches enter the cell cavities to suck up nourishment.

Now, these spores have a peculiar way of germinating. They live only a few days after they are matured. One may expect to have a new crop of spores every morning and sometimes a new crop is produced several times a day. As soon as they mature they fall off in a

drop of water. After about an hour and a quarter the contents of the spore divide up and the parts escape and swim around very rapidly about fifteen minutes and then they come to rest and germinate. If they are on the surface of a leaf where they can send out their threads they will propagate the fungus, but as I say they can't live over winter. There must be some other way and there is. This was discovered by Prof. W. G. Farlow.

The threads within the leaf produce thick-walled spores much larger and stronger than the other kind. They are called ovspores or egg-spores. They live over winter and germinate in the spring.

You will readily see that to burn the leaves would help to destroy the fungus, for the above is the only way in which it can live over winter. We can never hope to burn all of them, but we can burn most of the leaves of the diseased cultivated vines. The mildew grows on wild grapes as well as the cultivated ones. It is also found on the Virginia Creeper. This was first discovered at Lake Minnetonka by Prof. Farlow, a few years ago. It would reduce the mildew to destroy the wild grapes and Virginia Creeper.

The mildew does not confine itself to the leaf but runs into the berry. It probably does not originate in the berry but it goes through the stem. It gives the berries a brownish appearance, but when the spores are produced the berries are white. I have found them white all over with spores. Prof. Trelease found that the brown, rotting berries contained the fungus threads, and when kept moist spores were produced, making the berry white outside.

In Europe there is a white mold that grows on the upper surface of grape leaves, known as *Oidium Tuckeri*, but to what extent that occurs in the United States is uncertain. It probably occurs to some extent in New England.

In this country a white mildew on the upper leaf surface is common. It forms little black specks that are just large enough to be seen among the white threads. Under the microscope these black specks are found to contain the spores. It has been thought by some that there is a connection between this and the European mildew, but the black specks have never been found in Europe, and the connection is very doubtful.

Mr. Barrett. Can you tell us a remedy for these diseases?

Prof. Seymour. Destroying the leaves, as far as possible, is the best general remedy. You can't give a plant medicine, of course. About the only remedy seems to be to remove the diseased parts and

burn them. There is no way of curing the plant which becomes diseased.

Mr. Barrett. I was much interested in a statement that a great French physician makes a success with the treatment of diseased grape vines, by applying the principle of inoculation to the vine, but it is not stated how it was done or what was the substance used.

Prof. Seymour. I can scarcely imagine how it can be of any avail. I don't see how inoculation could help.

A Member. How are these fungus propagated?

Prof. Seymour. The fungi are propagated by germs which are carried in the atmosphere. It never originated without a germ. They answer the purpose of a seed. They correspond to seed in the higher plants.

Mr. Harris. Professor, for two years I have observed something which comes upon the grapes, and makes its appearance at first in a small round white spot, at one side of the berry, smaller than the head of a pin, but gradually extending and changing in color to a reddish brown and sometimes a reddish white.

Prof. Seymour. I think perhaps from the description it may be a grape worm if it is a small white spot, but the later development would seem to make it doubtful.

Mr. Pearce. I think that disease that Mr. Harris speaks of is rot. I was at Mr. Poole's place down near Farmington and saw it there. Mr. Rogers of New Jersey was present, and he called it the Grape Rot.

Prof. Porter. That is without doubt rot. I have been familiar with it for thirty years in the East. The characteristic of that rot is the peculiar iridescence that it has when you turn the grape toward the sun. I think you both are referring to the same thing, but have observed it at different stages. The grape affected by it is worthless. It never ripens; commencing with a small speck at one side it gradually extends in a circle, the white spot then shades off in a brown color.

Prof. Seymour. I don't think the subject is by any means exhausted. There are eighteen species known in Europe, and I have no doubt there are a good many now in this country to be looked up yet.

PEAR BLIGHT.

In 1878, Prof. Burrill of the University of Illinois was the first to suggest the bacteria as the cause of pear blight. He mentioned them in the Illinois Horticultural report for about 1878, I think, but in

1880 he began more exhaustive researches and found that bacteria was certainly the cause. Besides microscopic studies he made practical experiments. His plan was to take a little piece of bark that was diseased and put it in a healthy tree and then watched it and after a few days, a week or more, the healthy tree would become diseased and begin to blight. Then he used another mode of experimenting. He took a little of the fluid from diseased bark on an inoculating needle and introduced that into the bark of a healthy tree. This produced the disease just as before. He not only inoculated the pear trees from pear trees but also pear trees from diseased apple trees.

He found that fifty-four per cent of the pear trees inoculated from diseased apple trees took the disease, and in the case of pears inoculated from pear trees seventy-two per cent. That shows very plainly that the disease is identical in the two trees; it is the same in the apple tree as in pears.

He also inoculated apple trees, but the experiments on the apples were not quite so strong; the disease didn't work quite so freely. The apple trees inoculated from diseased pear trees took the disease in only thirty per cent. In cases of the inoculation of apple trees he also found that the progress of the disease was very much slower than ordinarily supposed. He found that it did not start very rapidly; that it was always slow; he found that it progressed an inch or so in the stem up and down before it became noticeable and the leaves he found did not turn black until a week or so after the disease had spread in the bark. At first the color of the bark is only slightly changed; it becomes black gradually, and it is only after the disease has been there for some time that it is noticed at all.

Mr. Whipple. Is that the Fire Blight you are describing?

Prof. Seymour. Yes, sir.

Mr. Whipple. I have seen cases of Fire Blight when the first appearance on the leaves, the circle affected being probably one-sixteenth of an inch through. It looks as if it was scalded by throwing hot water on the leaves and similar to that made by a drop of hot water on the leaves of the trees, and probably the next day the leaves would be all white.

Prof. Seymour. Probably that is the beginning of the blackening of the leaf observable. Probably the stem had been diseased before.

Mr. Whipple. It is possible that such was the case, but I couldn't discover any trace of it before.

Prof. Seymour. This change is very slight at first.

Prof. Burrill found it is on the young trees that the blight works most easily. In the summer, during the time that he was making these experiments there were a good many thunder-showers; he could not find that the blight worked any more rapidly or slowly during the thunder showers than before—couldn't see that they had any effect. Later he found that the blight sometimes occurs in winter as well as in summer, although to less extent.

The bacteria that produces this blight is perhaps $\frac{1}{1000}$ of an inch; from this fact it is not surprising that not much has been found out by the use of the old microscopes, but the microscopes have been so much improved that we can get a pretty distinct view of them.

Mr. Pearce. I would like to ask if they attack the sound tissues of a tree?

Prof. Seymour. Yes, they attack healthy trees if there is a break in the bark, if the bark is rubbed off to allow them to enter. The tree is not diseased before they get in. They grow in healthy tissues and make them diseased. The cells of the bark contain starch, stored up in little granules as food for the tree. Healthy cells are full. When the bacteria get in, they destroy the starch grains and starve that part of the tree. They can not enter through the bark when that is unbroken, but they may get in through the flowers in some other way.

On motion, the meeting was then adjourned until 7 o'clock P. M.

EVENING SESSION.

WEDNESDAY, JANUARY 20, 1886.

The meeting was called to order at 7 o'clock by President Smith.

The following lecture was then delivered by Prof. A. B. Seymour, of the State University at Madison, Wisconsin:

SOME FUNGUS DISEASES OF SMALL FRUITS.

Mr. President, Ladies and Gentlemen:

Before speaking of any particular disease, I wish to show how and why fungi produce disease in plants. It is well known that the green coloring matter occurring in all our common plants has the power of converting inorganic matter taken from the soil and air into food materials for the plant. All plant food and indirectly animal food is

produced in this way. The plants known as fungi, however, have no leaf-green and therefore are not able to provide themselves with food from soil and air. They must derive their nourishment from either living or dead organic matter.

Different kinds of plants grow on different soils. Fungi choose places of growth in much the same way that other plants do, but much more closely. Some grow on almost any decaying vegetable matter; others only on dead wood of some particular tree. A very large number grow only on living plants and commonly each species only on plants of some particular family or species. Wheat rust grows on various grasses, the orange rust of berry plants, only on raspberries and blackberries, while corn rust is not known to occur on any plant but Indian corn.

Where do fungi come from? How do they get there? They never originate spontaneously but always from reproductive bodies called spores, answering the purpose of seeds. These are very minute and so light that they are borne in the air like dust, and some kinds are carried in water. Under favorable conditions if they are brought to the right kind of plant, as corn smut spores to corn, they germinate and send out a slender tube which answers the purpose of a root, and makes its way into the plant, often through breathing pores. Once inside, it grows and branches, sending its threads in various directions among the plant cells. Frequently special branches are produced, which enter into the cell cavities and act as suckers to take up nourishment.

Many fungi have different stages of development, reminding one rather of insects in their transformations than of plants. Each stage has its own kind of spores. Frequently different stages occur on different host plants, as in wheat rust. This produces on the wheat itself yellow summer spores and blackish spores which live over winter. The summer spores retain their vitality only a short time; only the blackish spores can carry the fungus through the winter. In spring they may germinate on a different plant, the barberry, and produce a third stage there; the spores from this stage, in their turn, produce yellow rust on the wheat.

It has been claimed that where fungi grow on plants, the plants first become diseased and weakened and the fungus comes afterwards, following and not causing the disease. This may be true in some cases, but in all ordinary cases of this kind the fungus is the true cause of the disease. Certain conditions of weather are favorable to its development, just as certain conditions are favorable to the development of any oth-

er plant; but the conditions which favor the fungus may be unfavorable to the plant it grows upon and so give the former a double advantage. Moreover plants have a greater power and resist disease when abundantly supplied with food materials, when they are not exhausted by fruiting, when every condition is favorable to robust growth; but the fungus may grow and produce the disease in spite of all this. A man in robust health is less likely to succumb to a contagious disease, as small pox, but still he is likely to take it.

There are several ways in which a fungus may produce injury to the plant. One way, common to all, is by taking away the food of the plant for its own growth. On green parts, they destroy part of the leaf-green and so reduce the power of the plant to supply itself with food; in many cases the leaves fall, as from premature ripeness. Frequently the fungus causes an abnormal development of plant tissues as in the black knot of the plum tree and the curl of the peach leaves; or they arrest development, as in the orange rust of blackberry, so that rusted leaves are smaller than healthy ones. In many cases the flower or fruit alone is destroyed, as in the smut of wheat and oats, "double blossom" of blackberries and the swelling of young plums.

ORANGE RUST.

The most striking and most destructive fungus disease of swell fruits is the orange rust, (*Cæoma nitens*, Schw.) which occurs on raspberry and blackberry leaves, and is especially destructive on the latter. This has been most thoroughly studied by Professor T. J. Barrill, of the University of Illinois, and many of the following facts are from his investigations. This rust appears as a thick orange coating on the under surface of the leaves and attains its greatest development in June.

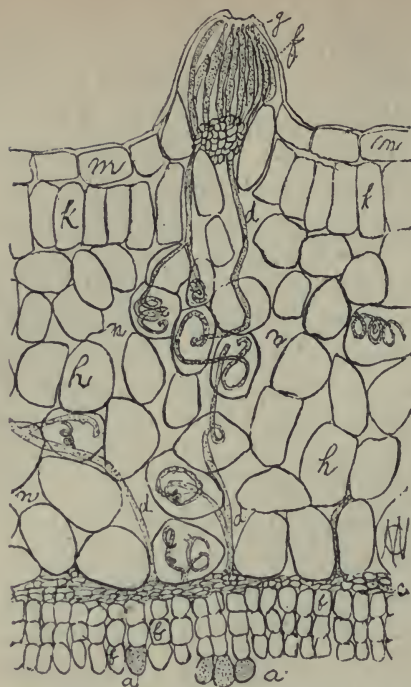


Figure 1—Orange Rust Fungus, *Ceoma nitens*, Schw. Cross-section of a diseased leaf; *a* spores; *b*, immature spores or sterile bodies; *c* bed of fungus issue; *d* mycelium threads; *e* suckers; *g* spermatogones; *h* cells of leaf; *m* epidermis of upper leaf surface. (After Burrill.)

The leaves do not reach their full size, are unusually rigid, and have a sickly appearance; something of this may be seen even before the yellow coating appears, and the latter at first appears in definite and paler patches, somewhat like scales, standing out slightly on the under leaf surface, covered by the epidermis, through which they afterwards burst. In this early stage, on the upper surface may be seen also yellowish specks, which on closer examination prove to be protuberances. There seems to be an exudation from these, which attracts insects.

Microscopic examination shows that the orange portion consists of a great number of roundish spores. Their surface is roughened with sharp points, by means of which it is possible that they adhere to insects crawling over the leaf and are carried by them to other plants. It is certain that they may be carried by the wind from place to place. They are produced in chains arising perpendicular to the leaf surface and those toward the inner end of the chain are either immature spores

or sterile cells. The spore chains arise from a bed or cushion of fungus tissue, from which may be traced the threads of mycelium running through the leaf tissues.

Some have special branches entering into the interior of cells and there forming coils, acting as suckers to take up nourishment. Some also extend to the upper surface, where they are connected with the yellowish bodies, *spermagones*, previously mentioned as occurring there. One of the epidermal cells is greatly enlarged and protrudes. In its cavity a thread produces a number of branches which extend nearly parallel toward the top and bear at their ends minute spore-like bodies, *spermatia*. Their office is not well known.

It has been believed by cultivators that this fungus lives over winter in the roots, and spreads to the stem and leaves in the spring; but this is not the case. It extends scarcely at all beyond the areas covered by the orange spores. More than this, it is found that the spores will lose their power of germination if deprived of moisture for a few days and will not live over winter. Hence it is believed that some other kind of spores is produced corresponding to the black spores of wheat rust, which carry the fungus through the winter. These have been carefully sought for, but heretofore without success.

Prof. Burrill has however at last found some evidence as to what they are, and it is hoped that his culture experiments, now in progress, will settle the matter definitely and lead to important practical results.

Some varieties of blackberries, especially the Snyder, are seldom, if ever attacked by this rust.

Remedies: Cut out and burn all diseased parts as soon as the disease appears, and as a preventive measure destroy any useless vines, as wild ones in fence corners or elsewhere, which might nourish the disease.

OTHER RUSTS OF BLACKBERRIES AND RASPBERRIES.

There are two other forms of yellow rust, one on blackberries only, the other on raspberries only, both inconspicuous compared with the preceding and never likely to be mistaken for it. They are quite similar to each other and bear yellow spores in minute pustules scattered over the inferior leaf surface. They sometimes do considerable damage but never approach the *Caeomas* in that respect. The general mode of growth much the same as in the *Caeomas* (Orange Rust) but the *spermagones* are absent and the spores are borne on stalks, from which they easily fall, instead of being in chains.

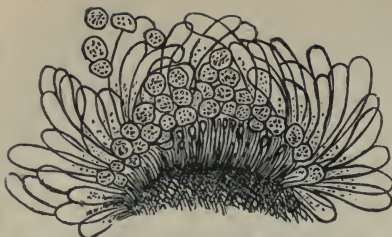


Figure 2—Summer or Uredo spores of the raspberry rust, *Phragmidium rubi-idei*. Spore cluster surrounded by club-shaped sterile bodies, paraphyses. (After Winter.)

winter spores. The yellow or summer spores of the two kinds differ but little from each other, but the form on blackberries is a little the more conspicuous. The winter spores are long, cylindrical, nearly black and tipped with a sharp point. The kind on blackberries is finely warty and divided by cross partitions into five or six cells; that on raspberries is coarsely warty and divided into seven to nine cells.

In this region the black raspberries are seldom attacked, but the red ones, especially in a wild state, quite commonly. The cultivated varieties of the red, Turner, Brandywine and Cuthbert, are reported to have suffered seriously from this disease at Jacksonville, Illinois.

The yellow spores come in August or September and the black ones soon follow. On the blackberry, the yellow spores come somewhat later, and the black ones have seldom been seen in this country.



Figure 3—Winter or telento-spores of raspberry rust, *Phragmidium rubi-idei*.



Figure 4—Leaf of currant showing diseased spots.

A CURRANT DISEASE.

In Western Massachusetts last summer (1885) the currant bushes were badly injured by a fungus (*Septoria ribis*, Desm.) growing on the leaves. The same occurs in this region on wild currants and gooseberries, on the cultivated currant in Ohio, and on gooseberries in Kentucky. The disease appears as brown spots on the leaves, angular spots limited by the veins and soon becoming dead and dry. The spots are good sized and when large or numerous, destroy nearly the whole leaf. It certainly has an exhausting effect on the leaf and many leaves become entirely exhausted and fall off.

The microscope shows the presence of a fungus growing among the leaf tissues in the usual way, but its mode of fruiting is quite different from those described before. Within the tissues and somewhat protruding on the surface are minute blackish postules or spore-cases (perithecia). At the base of the perithecia, within, arise threads which bear the spores. The spores are colorless, very slender and thread-like, curved, pointed at the free end.



Figure 5—Spore of currant disease, highly magnified.

The life history of this fungus is unknown, but it is known that many of this group are only the summer stages of species which live through the winter and mature in late winter or spring, either on the same spot with the summer form, as in the black knot of the plum trees, or on different parts where the summer spores have

been carried and have germinated. Many fungi of this class produce their winter spores on fallen leaves or twigs, for instance the black blotch fungus of maple leaves.

It is probable that this currant fungus has some winter form on the dead vegetable matter about the bushes. Hence the remedy should be sought in burning the leaves that fall and any other rubbish that might harbor the fungus.

A similar species *Septoria rubi*, West. is very common on blackberries all over the country. It produces roundish spots with a red or purple margin and a brown center.

DOUBLE BLOSSOM.

"Double blossom" is the name given to a blackberry disease that is quite prevalent and destructive in some regions. It is a disease of the blossoms, as the name implies, but they are not actually double. The several parts are abnormally swollen through the effect of the fungus, so that at a casual glance the flower appears double. It is killed of course and no fruit is formed. The mycelium runs through the tissue of the floral organs, swelling and distorting them, and at length sends out on the surface clusters of short, colorless threads, which bear the spores on their ends and produce a whitish, mealy appearance over the flower. The spores are slender and pointed, frequently curved, and divided by cross-partitions into two to four cells.

This disease was first observed and studied by Mr. F. S. Earle. He sent specimens to Dr. Winter of Germany and the latter has recently described and published it as a new species, which he refers with doubt to the genus *Fusisporium* and calls *Fusisporium rubi*.



Figure 6.—Spores of double blossom fungus, *Fusisporium rubi*, on blackberry. (After Earle.)

RASPBERRY CANE RUST.

The cane rust of raspberries and blackberries is rather inconspicuous but very destructive. It was first studied by Professor T. J. Burrill, who published an excellent account of it in the *Agricultural Review* for November, 1882. He states that it was first observed in 1878; since that time it has spread rapidly and caused great damage. One instance is given of a blackberry field that yielded a profit of four hundred dollars a year with promise of increase. This disease reduced it so that it scarcely paid expenses the next year.

The spots on the canes are rounded, of a grayish color and surround-

ed by a definite and slightly raised border. The fungus fruits by sending out clusters of very short, unbranched threads, each of which produces at the tip a minute, colorless spore, about twice as long as broad. It has never been definitely classified, but Prof. Burrill is inclined to class it *Sphaceloma ampelinum*, which produces one kind of black rot in grapes.

Remedy: Cut out the canes as soon as the berries are picked and keep the field clean.

In conclusion, I will say a few words about the treatment of fungus diseases in general. The thing to be continually and most earnestly sought is a knowledge of the life histories of the different species. This is essential to intelligent action, and this is what all earnest students are seeking. Some progress has been made, with good practical results. But it requires an amount of time and patience, care and accuracy, that one can scarcely conceive of till he has tried it and one can scarcely hope for success unless he has an absorbing interest in the subject for its own sake, as a science. Most of the world's valuable discoveries have been made by men moved by the love of science. No mercenary motive will answer in its place.

Besides interest and ability, a man must have means to work with. He must know what others have done and what methods they have used to gain their results; hence, he must have books. He must have microscopes and other apparatus for his investigations. Considering the interests involved, the amount of damage done to crops by fungi, the desirability of increasing the knowledge of the subject and of educating the people with regard to it, it would seem that the State might well afford to furnish the means for subsistence and for investigation to someone who will give his best efforts and interest to the work, such interest as only the work itself will satisfy, and which is essential to success. Yet results can not be guaranteed and much patient waiting and disappointment may be unavoidable.

In the meantime the best general mode of treatment is to destroy all diseased plants or part of plants and any useless living plants or dead matters that might harbor disease.

The following paper was then read:

CLIMATE, FORESTRY AND HORTICULTURE.

PROF. D. R. MCGINNIS, St. Paul.

It is not possible within the limited time necessarily allotted to the consideration of the many important subjects, brought before this meeting, relating to Horticul-

ture and its allied sciences to go into an exhaustive discussion of the relations of climate to Horticulture. The field is so broad and the connection between the two is so complex and they are so mutually interdependent on each other, that it is only by a series of long continued observations and a careful study of the results outlined thereby, that an intelligent understanding of this subject can be had. What we shall have to say this evening will refer to the climatic influences of the United States and more particularly of Minnesota and the Northwest on forest and plant growth. But first we wish to refer to those meteorological terms which by the operations of the signal service are brought so prominently before the public and which it is necessary that we should thoroughly understand before we can have an intelligent conception of the meaning which they convey. Those who are interested in the weather (and in this capricious and variable climate it is a subject of perennial interest) will often find in the predictions issued by the chief signal office, references made to areas of "high pressure" and "low pressure," to a probable increase or decrease of the same. It will be found that this refers to the specific gravity or weight, if you please, of the air, and changes in the same which from the expansion produced by the heat of the sun, varying amounts of moisture, the rotation of the earth on its axis and other causes is perpetually varying. Thus as an equal amount of dry, cold air is heavier than an equal amount of warm air saturated, or nearly so, with moisture and as the air within storm areas is always warmer and contains a greater amount of moisture than outside the storm's influence, it follows that the cold, heavy, dry air rushes in from all sides to the centre of the storm, but the revolution of the earth on its axis deflects these winds to the right of the centre in the northern and to the left of the centre in the southern hemisphere, causing the wind to blow in great spirals and thus setting up those great gyrotory systems of winds, blowing around a calm centre, which are called cyclones, or areas of "low pressure". An area of low pressure or cyclone is not necessarily accompanied by rain or snow. Sometimes, and often in Minnesota, it is the case that its energy is only expressed by high winds and cloudy weather, but it is safe to say that rain or snow will be an accompaniment of the cyclone during some part of its existence. In this latitude these great disturbances in the air move in a general course from west to east and taking advantage of this law, it is possible to predict the weather in advance of their occurrence; sometimes a product of the conditions to which the cyclone give rise is the "Tornado" with the effects and appearance of which, some of you are doubtless familiar, as Minnesota, though near their northern limit is within the region of their occasional occurrence. As there is a general and widespread misapprehension as to the proper use of the terms, "Cyclone" and "Tornado," we append the following as explanatory thereof, from the Weather Review of the chief signal office for October, 1885.

"A cyclone is a large, gyrotory storm, generally from 500 to 1000 miles or more in diameter with a considerable area of low pressure in the interior. A tornado consists of a very small and violent gyration of the air; generally much less than a mile in diameter, with a rapidly ascending current of air in the centre, and low atmospheric pressure very near the centre, although there is generally too much violence of agitation for it to be observed, and it is specially marked by a characteristic funnel-shaped cloud with a progressive movement."

A peculiarity of the tornado is that it invariably occurs a little to the southeast

of the storm center and usually at a distance of from 250 to 300 miles therefrom. As storm centres rarely pass more than 300 to 400 miles north of Central Minnesota in the summer, the season of their occurrence, it is probable that a true, well-defined tornado has never occurred north of the line of the Northern Pacific Railway.

The influence of climate on plant growth, whether for good or evil, depends on the relative proportion of the different agencies which give to each part of the globe its distinctive climatic characteristics. One of the most important, as we all know, of these agencies in limiting plant growth, is the amount of moisture which the air contains, the amount which is yearly condensed in the shape of rain or snow, and the activity of evaporation, which again depends on the dryness and temperature of the air. The warmer air is the greater inherent capacity it has for containing water in the shape of a vapor or gas, and therefore, its greater evaporating power; and this being so, it would follow that the higher the annual average temperature of a place the greater would be the need of an increased rainfall to supply the deficiency caused by an active evaporation, and consequently lost and not available for plant needs. Minnesota has twenty-eight inches of precipitation in the form of rain or snow during the year and Southern Texas the same amount, yet Minnesota has verdant pastures, fields of waving grain, dense forests, full-voiced rivers, and all those indications of a climate having a proper balance between the elements of heat and moisture, while the Central Rio Grande Valley, being much warmer, is possessed of essentially arid characteristics. A traveler commenting on this excess of evaporation, says: "To-day we had a violent thunderstorm during which torrents of water fell." Three days after he says: "From the effects of an unclouded sky and a burning sun all traces of the heavy rain have disappeared; the scanty vegetation is again drooping with drought and the earth a bed of dust."

One inch of rain during the bland summer of the Red River Valley is ample for plant needs for a fortnight. Provided the summers are warm enough to ripen the wood, forests in temperate regions seem to prefer the colder part of the temperate zone where though the annual rainfall is small, as in the British Northwest, and it be only from seventeen to twenty-two inches in the course of the year, yet there are found extensive forests of coniferous trees. That amount would be totally inadequate for plant needs in the warmer regions, but in that country the low annual mean temperature, by diminishing excessive evaporation, makes nearly all the precipitation available for promoting forest growth. It is also evident that forests are best suited to those places where the rainfall is not restricted to a part of the year, leaving the balance dry and endangering the integrity of the forests from fires during the dry season. California and the North Pacific coast with their magnificent forests of conifers would seem to be an exception to this but it will be remembered that although California is almost absolutely without rain during the hot months, yet the forests are there invariably found where from proximity to the ocean or from great altitudes, the absolute or relative amount of moisture in the air is so very great that by diminishing excessive evaporation it practically takes the place of rain, and husband the moisture derived from the heavy snows and rains of winter through the long months of drought until the rains come again. The forest regions of the North Pacific coast do indeed have a rainfall during all the months of the year, but this is so small during the summer and so near the limit of excessive dryness that a very small diminution from the normal amount invariably produces

those destructive forest fires of which we read, as in summer of 1883, that they raged for weeks and so filled the air with the smoke of their burning, that the sun appeared as a ball of copper and the obscurity at midday so great that navigation was rendered most difficult and dangerous.

In the Northwestern angle of Montana, up near the British line is also a grand forest covering several thousand square miles of mountain and valley, and existing under the same climatic conditions as on the coast, except that perhaps remote as it is from the ocean a more narrow margin exists as to limiting dryness, thus making the danger from destruction from fire greater than on the coast. A lumberman from Wisconsin who has carefully examined this forest, on being asked if he did not fear competition from this source with the lumber of Minnesota and Wisconsin, said: "The climatic conditions under which this forest exists are so precarious that since the Northern Pacific Railway has penetrated the heart of this region, making it accessible to the destroying hand of man, that I expect in ten years to see it obliterated by fire from off the face of the earth." It is a source of gratification to those who have the best interests of the country at heart to know that this great danger is appreciated at its full value and that a prominent member, with wise foresight, has introduced a bill in Congress providing for the withdrawal of this tract from settlement, and containing provisions looking to the preservation of this forest tract in a manner which while providing for its perpetuation, will secure the proper use of its resources to the people.

Minnesota from its geographical position in the centre of the continent, nearly equi-distant from the oceans and their modifying influences, has in common with all other countries similarly situated in its latitude, an essentially continental climate. The effect of this remoteness from these equalizing influences is to cause great differences in the seasons, the winters being cold with great extremes of temperature and the summers warm but not hot, and the amount of moisture to be decidedly variable in quantity. These variable qualities of the climate, while undoubtedly very favorable to the best mental and physical development of man, and by the avoidance of the diseases and pests of warmer localities peculiarly adapted to the profitable production of live-stock have an important limiting influence on perennials or those plants in which growth and development do not take place in a single season. While the summers have an almost ideal temperature and rainfall for the development of the apple, pear, peach and other fruits of temperate latitudes, in their highest perfection, the great extremes of cold during the winter except under favorable local influences are almost if not quite decisive against their profitable production. It would seem that the intelligent horticulturist recognizing these inevitable limiting influences, would seek to produce those fruits such as the Russian apple, the plum, raspberry, currant, cranberry and other small fruits, which seem not only to be tolerant but absolutely to require a cool climate to suit the requirements of their best growth.

As to the parts of the State most suited by climate to fruit raising, the southeastern part in the partially timbered counties, and that part north of the cities of Minneapolis and St. Paul and east of the Mississippi, extending north to the Northern Pacific Railway and Lake Superior, will undoubtedly, by reason of the heavy forest belt and its proximity to the equalizing influence of Lake Superior be exceptionally favorable to the growth of the grasses and small fruits.

Regarding forests, it would perhaps be interesting to give some of the results of observations taken during the year just past at stations of the State Weather Service on their influence as a modifying agent of the climate of Minnesota.

Scientists agree that while the evidence at present available does not fully establish the fact that forests increase rainfall, other than to a slight extent, yet no fact is more apparent than that they serve a most important part in the economy of nature, by averting extreme and sudden changes in temperature, and more particularly by protecting the earth from the direct rays of the sun and drying winds, to check excessive evaporation and husband the rainfall, permitting it to gradually sink into the ground only to again appear in the form of springs which feed the rivers; a full and constant volume of which is so necessary to the economical prosperity of the State. As an instance of the important part played by the forests of Minnesota on the volume of water in two of its principal rivers, it may be stated that the Minnesota river has a drainage area of 19,000 square miles, nearly destitute of timber. The Mississippi, above their junction, a drainage area of 23,000 square miles, nearly all forested. As a result, at the confluence of these two streams the Mississippi drainage area furnishes at least seven times as much water as the Minnesota area. Let the present rapid deforesting of Northern Minnesota be continued, and aside from the influence of the government reservoirs, the amount of water in that stream will ultimately assume insignificant proportions and become practically unavailable for manufacturing purposes.

The beneficial effects of what are called the "Big Woods" in arresting sweeping air currents and gales, a result so much to be desired in this climate, will be appreciated when it is understood that Bird Island on their windward side has in round numbers a movement of 8,500 miles of wind each month, and St. Paul on the leeward side only 4,000, less than half as much as it will have when that forest is cleared away, as it surely will be unless the people of this State awake to the importance of its preservation.

Another undoubted influence which the Big Woods have is by their resistance to the free movement of the air, to cause many of those bodies of frigid air called "cold waves," which sweep down from the north, to be deflected over the broad treeless plains of Dakota and Nebraska and, as was instanced last autumn, to be often felt at St. Louis, Mo., before they were, if at all, at St. Paul. They, with Lake Superior, cause the winter isotherms or lines of equal heat to extend nearly north and south instead of east and west, and thus make Duluth and Minneapolis nearly if not quite as warm as Sioux City and Yankton. Similar instances of the mild and genial influences which this forest exerts on the climatology of this State could be multiplied indefinitely. But we will close this paper by expressing the hope that the people of Minnesota will in the near future supplement those at present in force by a code of forest laws looking to the preservation of a proper percentage of the existing forests, and their extension over the treeless part of the State; these laws to be based on an intelligent conception of the necessities of the present and the demands of the future.

The following paper was then read:

AESTHETIC FEATURES OF HORTICULTURE.

By H. H. YOUNG, St. Paul.

Our American ancestors, having little leisure to devote to anything not intimately connected with their necessities, were compelled by circumstances to take strictly utilitarian views of life. Contemplation of the beautiful did not contribute to supplying their physical wants nor augmenting their fortunes, hence they left it to poets and other imaginative impracticables, whose utopian ideas seemed to them only worthy of derision. They appreciated solely the beauty of what was useful, and, in their eager pursuit of competencies for themselves and families, whatever seemed most available for service in this direction became admirable, though it might in itself be ugly to the degree of repulsiveness. Even the comely person of the marriageable damsel, who lacked ability to assist materially in laboring for the maintenance of the family, or was without a considerable dower, was less attractive than homely efficiency, or wealth. Heaven itself, instead of being a bower of bliss like the ancient garden of Eden, with its groves, and meads, and murmuring streams, became to them a magnificent city built of precious stones and paved with gold, and had no tree but the tree of the bread of life growing therein.

There was, however, a sufficient excuse for those rugged and eminently practicable grandsires and forebears to disregard the beautiful. Their hands and thoughts found other tasks for their employment, than the formation and contemplation of what was merely ornamental and elegant. It fell to their lot to enter upon and open up for civilized occupation a new and wild country. To invade the dense and extensive forests and clear them off in order to make room for their own homes in the wilderness, and to open patches of land for cultivation, and they accordingly laid waste lustily with axe and fire, without discrimination and with little concern for the future wants and wishes of the race. Majestic oaks and elms, poplars and maples, walnuts and hickories, fell crashing to the earth beneath their stalwart blows, and, with graceful sycamores, wide-spreading beeches and pliant willows, were consigned to devouring flames. None were spared because of their grandeur or gracefulness, but large and small, stately and deformed, valuable and worthless were alike included in the general sentence of condemnation, which pronounced them useless cumberers of the ground and obstructions to the growth of golden grain and other nutritive products of cultivated lands.

When a farm was being opened in that age, the universal prevalence of the forests was reason enough in itself why no thought should occur to them of leaving trees for ornamenting the grounds about their residence sites; and, as groves in its vicinity would have been senseless superfluities, because of the proximity of the wild-woods, it could not be expected that care would have been taken for their preservation. The desirable thing to be accomplished was to clear the land of its timber, in order that the fructifying beams of the sun might have free access to the soil, and the sooner this was done the better for the welfare of the settlers. So, too, in laying out a new village, parks and shade trees were unnecessary, the demand of the hour being for open space on which to build and plant gardens and grass-plats. If some venturesome wight of Aryan instincts, who recognized tem-

ples to the living God in groves of majestic trees, or whose prophetic vision penetrated far enough to enable him to perceive the wants of generations to come, had suggested preserving a park or grove, as a place of popular resort for all time to come, he would only have drawn upon himself the ridicule of his fellow citizens, and no doubt been so jeered and mocked at as to render his life thereafter in that neighborhood decidedly unpleasant. With abundant forests surrounding them on every side, it was impossible for the people of that period to imagine the sentiment that our experiences have made common with us.

Looked back upon superficially from the present, that unreasoning devotion to a narrow utilitarianism, seems only less excusable than the irrational enthusiasm that condemned to death those accused of witch-craft. In both cases the results of their misguided zeal must occasion emotions of regret; but we ought not to forget that the conduct itself grew out of honest motives for the welfare of society so far, at least, as the great mass of actors in both instances were concerned. That mistakes were committed in both cases is not very strange. Mankind has been fatigued to the commission of errors since Eve accepted the forbidden fruit in paradise; and we with all our enlightenment have not escaped errors or freed ourselves from liability to err.

There were two reasons why our forefathers could not realize the value of the forests. The first, the almost universal prevalence of heavily timbered country, has already been mentioned; but the second, the demand for timber for building and fencing on the prairies, for the construction of farm machinery and for railway ties and telegraph poles they could have had no conception of whatever. They were ignorant of the existence of these vast, unwooded plains, and of farming machinery, telegraphs and railways they did not even dream. Had any one predicted even fifty years ago, the extent of the demand for timber that now prevails, and the variety of uses to which it is applied, his sayings would scarcely have commanded more attention than the ravings of a lunatic. It was the mission of our ancestors to clear the land for cultivation. Trees were their enemies, just as much as the Canaanites were enemies of the ancient Hebrews, and for the same reason, that both occupied the promised land. The first business of the latter, after they crossed the Jordan, was the wiping out of the idolatrous nations; and the first duty our ancestors were called upon to perform on this side of the Atlantic, was the denudation of the land of its excessive growth of timber. Both it seems left a Gibeonitish remnant for future usefulness; in the case of the Hebrews, this was unfortunately too numerous for the happiness of their posterity, while our fathers cut somewhat too closely for our good. We may regret the consequences of their zeal but should not reflect unkindly upon their memories for that reason.

Through their toil and privations we have come into goodly possessions; and their devotion to what was useful, affords us time and opportunity to study and enjoy the beautiful. But are we doing this as diligently as we should? Do we not inherit too great a proportion of their devotion to utility? Have we really learned that there is usefulness in beauty? That it is this which refines our manners, purifies our desires, elevates our thoughts and makes our lives more enjoyable? Have we learned to serve God more acceptably amid agreeable surroundings, than under circumstances ungrateful to the physical senses? If we have not, we are still unable to appreciate the beautiful, and should strive to educate ourselves up to a

higher standard of æsthetic culture. We certainly have learned that beauty and utility are not incompatible terms, and but few among us will dispute that the study of æsthetics is quite as important as much of the learning now considered essential in our schools. That the acquisition of this knowledge is more agreeable than that of much else which is taught, and that its pursuit has a salutary influence on the mind and life of the learner will, I think, be universally admitted.

But the inculcation of a lesson in æsthetics is no part of the intention of this paper, and I fear that I have already used too much of your time in introducing the theme proposed in the title, but hardly yet alluded to. If you will bear with me a few moments longer, however, I will endeavor to apply the ideas I have advanced to the science of horticulture, and ask for this branch of the study the recognition and approval of this association. In most other of the practical sciences, the importance of æsthetic features is already acknowledged. The outer decorations of our dwellings with handsome cornices, graceful columns, ornate towers and castellated chimney tops, do not affect the health and comfort of the inmates, yet they are recognized as essentials in architecture, and add largely to the value of the building. Even the renter of a humble tenement, who earns his money by his daily toil, will willingly pay more for a residence that has an attractive exterior. The same desire to embellish and beautify is also manifested in the interior finishing and furnishing of modern residences. Even the cheapest quality of furniture must make pretensions to beauty to find purchasers; and while many of the window trimmings, wall hangings and other decorative objects may yet exhibit crudities of taste, there is certainly vast improvement in this respect within the last quarter of a century. The old fashioned window shades and half curtains are relegated to attics and unused apartments, to make room for graceful lambrequins and laces. Common wood cut prints and black silhouettes are banished from best rooms, and their places usurped by well executed engravings, chromos and photographs; and in place of wreaths and ornaments of straw and autumnal leaves, we now find elaborately wrought embroideries and other truly artistic ornaments. The flower beds and borders which ornament the house yards are no longer limited to a few varieties of common flowering annuals, but teem with a profusion of gaudily colored exotics, gathered from every land with which we have commercial intercourse. Even business houses and offices of professional men seem to have caught the infection, and wherever we go our eyes are gratified to observe efforts at decoration more or less tasteful and mature.

In short, we are unconsciously tending, in every walk of life and among all classes of society, to increased love for and devotion to the beautiful, and it behooves our horticulturists to accept the situation and strive to discover and teach correct rules for decoration in selecting varieties of trees and shrubs for groves, yards and streets; and in planting and training the same so as to produce the happiest effects. If this is done now, in this western country, we shall escape the infliction of a long succession of incongruities and crudities, through which the individual members of the community will each endeavor in his own way to arrive at the knowledge for himself. Even now, if we will take a cursory look through our respective neighborhoods, we can hardly avoid perceiving what results such individual experiments must lead to. In a large level yard, where the ground is covered in the spring and early summer with a luxuriant growth of grass, and where shade is essential for

beauty, how often do we find a few scraggy pines or cedars, with limbs starting out nearly level with the ground and tops running up to a peak; mingled, perhaps, with half a dozen slender poplars or spindling ashes, none of them casting enough shadow to shelter a cat or dog. On the other hand, it is by no means uncommon to find wide spreading and thickly foliated maples, box elders and lindens occupying limited areas, and completely shutting out from the ground beneath the light and warmth of the sun. Look, too, along the streets of many of our cities and villages, at the incongruous varieties of shade trees which are frequently displayed; many of them possessed of beauty in themselves, but robbed of their charms by the associations in which they are found.

Do not these sights evince a want of knowledge, and prove that instruction is needed as to what is truly tasteful in the selection of trees? I think so. But the greatest need, perhaps, for æsthetic training in horticulture is shown in many of our public parks. I have now in mind a handsome little park, that might be a perfect gem of beauty, but for the uncultivated taste displayed in the selection and training of the trees. These are all tall and limbless to the height of at least fourteen feet, with tufts of tops scarcely exceeding four feet in diameter and so sparsely limbed that the sunbeams shine so freely through them that they serve little more purpose of shade than flagstaffs would. True they may, in time, put forth additional limbs, but under the most propitious circumstances they can never grow to be good-looking nor to serve fully the purpose for which they are designed. In another city, I know of a much more extensive park where the trees are all low and bushy, and all of the same kind. In this instance, too, they are planted in straight rows as though beauty consisted in exactness of parallelograms. I have frequently been led to suspect, when observing shade trees on the sides of streets, that the rule observed by those who planted them was: to put the least umbrageous trees along the widest streets where they would do the least good, and the widest branched in the narrowest thoroughfares where they would be the greatest possible nuisances.

Somebody has said that true beauty consists in contrasts, but I beg leave to differ. It will not do to announce that, even as a general rule. Nor is it true that sameness is beauty. Congruity, fitness, adaptation, are necessary to awaken the delight of those perceptions which recognize beauty. It is these relations to each other that constitute harmony between a series of objects, or between the several parts of the same object. Without harmony there can be no beauty, either physical or moral. This is true of music, painting, architecture, and, indeed, of every branch of art, and it must be equally true of horticulture. A degree of contrast is, of course, necessary to harmony; but violent and inharmonious contrasts are always more or less offensive to the perceptive faculties. Suitableness is a far more essential quality in æsthetic culture than contrast; for that which is not suitable, not adapted to the situation it occupies, or the use which it designs to serve, must be a positive deformity, although beautiful under other circumstances.

Large trees in confined localities dwarf the grounds they occupy into insignificance, and tall spindling trees palpably develop their own poverty of foliage in roomy situations. Such arrangements of objects are obviously inconsistent in their relations, and disfigure rather than adorn the scene. Let there be variety and contrast, but keep these attributes within the bounds of congruity. A little reflection ought to convince us that careful and mature study is required to enable us to se-

lect, arrange and train shade trees, whether in public parks, along the sides of streets and avenues, or in private grounds, so that the most charming effects will be produced; and as no one probably now-a-days will deny that the contemplation of beauty tends to refinement and moral elevation, it will be generally admitted no doubt, that the results of such are as likely to prove compensatory to the community, as those arising from devotion to music, painting or any other branch of the fine arts. That the subject is eminently worthy the attention and fostering patronage of this association, will not, I hope, be disputed. It should not be limited to trees either, but so extended as to include all kinds of ornamental shrubbery, not omitting regard for the effects produced by the various colored blossoms and flowers.

Nature, we are told, affords innumerable practical lessons touching every department of this subject, and is a reliable and proficient teacher. This is true, if nature shall be sagaciously interpreted, but who trusts to nature alone for instruction will find himself ultimately in possession only of a mass of crude ideas, which he can hardly render available for any use. It would be scarcely more blameworthy to depend solely upon nature for revealing the wonders of the science of astronomy or opening to our comprehension the deeply hidden facts of geology. To educate ourselves thoroughly and successfully in any science, simple or intricate, we must become acquainted with the thoughts and opinions of our fellow-men respecting it, must learn the results of their observations and experiences; otherwise we are likely to grope in darkness and ignorance from infancy to old age and leave the world no better by our having occupied a place in it. Moreover, by availing ourselves of all the opportunities afforded for acquiring information, we shall become better able to realize and enjoy the salutary influence of the beautiful on our own lives, and live the happier and die the more blessed for the knowledge we have gained through toil that yielded us joy even in its performance.

The following paper was then read:

LANDSCAPE GARDENING.

CYRUS L. SMITH, Minneapolis.

Fifty years ago the art of Rural Adornment was comparatively unknown in America; to-day we boast of many magnificent parks, while public buildings throughout the entire country are surrounded with gardens and grounds rich in treasures of tree, plant and flower. Fifty years ago whatever we had of rural adornment was an imitation of the English or geometric style; to-day we have a system of landscape agriculture that is distinctively American. Imperceptably the spirit of this system has influenced the work of those engaged in rural improvement until to-day we can hardly find a trace of the old system. More than that, the American idea of landscape architecture, or rural adornment has crossed the Atlantic, and like other American ideas, is supplanting those of England, France and Germany. The credit for this is due largely to A. J. Downing, who might appropriately be styled the founder and apostle of American landscape gardening.—a man of rare good taste, a finished scholar and ready writer of enthusiastic nature; thoroughly in love with his profession, he was peculiarly fitted for his great work; he has, however, had many willing, enthusiastic and able disciples, whose labors

around the suburban homes of Boston, New York, Washington, Chicago and other cities speak not alone of the abilities of the teacher, but show also that the students have been quick to learn and profit by his teachings.

To the careful observer it must be at once apparent that the art of rural adornment is only in its infancy. The work of the park commissioners in the city of Minneapolis during the past year has taught the people of the city, as a whole, more in this subject than they had learned before during our thirty odd years of existence as a city.

Rural adornment is a Kindergarten school where object lessons are being taught day by day that are remembered and acted upon, the restless ambition of the average American citizen to out-do his neighbor will constantly develop new ideas in this as in other things; some of these ideas will be crude and inappropriate at first but another and more skillful mind takes off a little here or adds a little there, until it develops into a thing of beauty and pleasure. To foster and encourage these ideas and to cultivate a taste for the true and the beautiful in the adornment of our rural homes is certainly within the province of this Society. Very few perhaps have the ability to lay out and suitably arrange even a small garden plot yet nearly every one can recognize the difference between the place where walks, trees, vines and buildings are tastefully arranged, even where there has been lack of taste displayed. Beauty of outline, harmony of shape and color, are pleasing to the eye and fill one with feelings of pleasure.

I do not understand why the press of the western cities do not pay more attention to a subject of such general interest, although every year shows marked improvement; still there is a vast amount of time, money and good material wasted on account of ignorance in regard to even the first principles of rural adornments. It will be my aim in this essay to point out some of these principles, as I understand them. I write for the climate of Minnesota and with the experience of twenty severe winters, as many summer droughts, and many exasperating failures.

THE GROUND

To be adorned is of most vital importance. My ideal is an undulating surface, similar to that on the shores of Minnetonka. Where it is possible, let your grounds embrace a bit of water; if naturally, so much the better; if not, have it artificially if you can. Don't make the too common mistake of clearing away the timber and leveling the ground; this seems to be a sort of mania with some people. No sooner do they acquire a bit of ground than they proceed to level it. The work Nature has done,—the graceful, sweeping curves, the rounded slopes,—are all squared and leveled; then they are ready to improve. As a rule you cannot improve upon the slopes and curves of nature; a little touching up here and there is all that will be necessary.

Rural adornment is to be accomplished with an artistic arrangement of grass, trees, vines, shrubs and flowers. The arrangement of your grounds should be such as to give a place for each of these, so that while they have each a character and individuality of their own, they will together form a perfect whole that will be harmonious and beautiful. The rear, or blind side of the house, stables and kitchen garden, should be concealed from view by trees and shrubbery or grape trellises, the outlines of which should always be rounded; the stable yard should be reached by a curved drive; the wood yard for drying clothes, and everything that could in

any way mar the beauty of the place should be concealed by screens of vines or trees. In the arrangement of trees be careful not to shade the house too much, never planting trees or allowing them to grow so near the house or so thick that grass will not grow; sunshine is more necessary than shade. Draw your plans carefully, picture to yourself just what the use and effect of each walk, tree, or shrub will be, never forgetting that grass is the most important factor in the arrangement. When your plans are completed and revised to your satisfaction, the next thing is the preparation of the soil. Here very much will depend upon conditions. A rich, dark loam, with a slight mixture of clay, is best; if you have this, all that is necessary is to work it deep (eighteen inches to two feet); but if the soil is poor and sandy you must add clay and manure; if cold, heavy clay, add sand and manure.

LAWNS.

How can I best obtain a fine lawn? is a common question, and one that should be carefully studied, for it is the crowning feature of any rural home. This cannot be obtained by laying down some sod on a sand bank, with perhaps a few inches of soil; nor by heavy surface manuring. The ideal lawn is smooth, velvety, rich, dark green, from April to November. To obtain this, good rich soil is essential, and the right kind of grass and frequent manuring.

If the soil is not good make it so. I consider cow manure the best to be had. Don't forget to work the ground two feet deep on small plats; this can be done with the spade; and larger ones, with the subsoil plow, using the manure while subsoiling. Let the surface be made smooth, rolled evenly, all stones raked off, and you are ready for the seed. Use about two bushels of red top, three of blue grass, and ten pounds of white clover to the acre. Some will say this is too much, but what is wanted is a smooth, velvety surface. Do not sow any oats, timothy, or any other coarse grain, or grass, and never allow your lawn to go to seed; never mow it after October 1st. Give a dressing of well-rotted manure in November; do not walk or drive on it in the winter; never allow slops to be thrown on the lawn in winter; it will injure it worse than in summer. If there are patches that annually turn brown in July and August, dig them up, work in cow manure quite freely two feet deep and re-seed it. If little hollows appear gradually fill them up, adding one-half inch or more of loam at a time. Do not water in the middle of the day; if you use water apply it freely in the evening, but if the ground is properly prepared nature will provide all the water that is necessary. Having your lawn once in good condition go over it once every two weeks with the lawn-mower, and at least four or five times each summer with a heavy roller. One who has never tried rolling a lawn will be surprised to see how much it adds to the smooth, velvety appearance so much to be desired, so greatly admired and so seldom acquired.

WALKS.

Having thoroughly marked the soil and got it in proper condition, lay out your walks and drives; ordinarily these will be graveled. The soil should be excavated four to six inches for walks, and eight to twelve inches for carriage ways, and filled even with the surface with gravel; never raise the walk above the level of the lawn nor leave it, as is sometimes done, a few inches below. It is the least ornamental part of the grounds and should attract as little attention as possible. Walks should be not less than three nor more than five feet in width; nine feet is

a very good width for drive-ways; eight is wide enough: for large grounds ten feet looks well. Lines should always be curved and they should follow the slope of the grounds in such a way as to carry off the water freely, either winter or summer. The edges should always be kept smooth and even; the gravel should be screened, and whether coarse or fine, should be as nearly uniform as possible, crushed stone is very nice for walks or drives, and where it can be procured as cheaply as gravel it would be preferable; if you are troubled with weeds or grass in the walks use salt freely, it is the cheapest way to keep them clean.

Having arranged the grounds, walks and drives, we now come to the selection and arrangement of trees, for these are the crowning feature of all rural adornment; it is here that all the faculties of the mind are brought into full play. Color, shape, rapidity of growth, adaptability of soil, and exposure, relation of surrounding objects to each other, all these and many other questions must be considered before we decide what to plant. If, as is frequently the case, there are native trees already on the ground, they should be utilized as far as possible. We have in Minnesota such an abundance of ornamental shade-trees whose characteristics are so perfect we have no need to go abroad for trees to ornament our grounds. The following list of deciduous and evergreen trees we consider sufficient for the purpose of adorning the largest ground. With the exception of the six last named, and we could very conveniently dispense with them, they are all natives of Minnesota, well adapted to our soil and climate; if properly planted they will live and grow strong, healthy and beautiful, very much superior to any of the sick, stunted, worthless importations that cost so much and amount to so little.

Following is a list of trees suitable for ornamental planting, found growing naturally in the forest of Minnesota:

White Elm, *Ulmus Americana*; Rock Elm; Corky Elm; Slippery Elm; Hard or Sugar Maple, *Acer Saccharinum*; Red or Scarlet Maple, *Acer Rubrum*; White or Silver Maple, *Acer Dosycarpum*; Ash Leaved Maple (*Boxelder*), *Negundo*; Hackberry, *Cettis Occidentetis*; White Ash, *Fraxinus Americana*; Green Ash, *Fraxinus Viridis*; Black Ash, *Fraxinus Sambuci Folia*; Basswood or Linden, *Tilia Americana*; White Oak, *Quercus Alba*; Burr Oak, *Quercus Macracarpa*; Red Oak, *Quercus Rubra*; Black Oak, *Quercus Tinctura*; Jack Oak, *Quercus Nigra*; Black Walnut, *Juglans Nigra*; Butternut, *Juglans Cinerea*; Black Cherry, *Cerasus Virginiana*; Bird Cherry, *Cerasus Pennsylvanica*; Several varieties of willow; White Birch, *Betula Papula folia*; Yellow Birch, *Betula Excelsa*; Cottonwood; Iron Wood, *Olueya Tesuta*; Tamarac, *Tarix Americana*; White Pine, Jack Pine, Red Cedar, White Cedar, Black Spruce, White Spruce, Balsam Fir, Lombardy Poplar, Silver Poplar, European Larch, Scotch Pine, Austrian Pine, Norway Spruce, *Abies Excelsa*.

One would not be expected to use all of these varieties on a city lot of half an acre or less, but for the farm or for exurban grounds of three or more acres they could be used with good effect. If there is only room for one tree plant a White Elm; if two, an Elm and a hard maple. I place white elm first on the list, but at the same time some of our tree planters think too much of the elm. The boxelder is a very fine tree, hardy, quick-growing, starts out early in the spring, makes an abundance of shade, requires very little care, is easily propagated and bears transplanting well. But of all the varieties of trees, taking shape, color and everything into consideration, the hard maple is the king; naturally upright and symmetrical

in shape, it produces a profusion of rich, beautiful green leaves, in early spring that, after furnishing shade all summer, change in autumn to all the rich and gorgeous shades of yellow, brown and red, giving to the autumn landscape brighter, richer and a more dazzling show of color than any half dozen other trees combined. Any park, garden or ground that has not the hard maple is incomplete, like a church without a steeple, a flower garden without a rose, or home without a wife. The objection usually urged against this best of all trees is that it is shy of transplanting, grows slow, is liable to die out. Admitting this to be true, still the tree is worth extra care in transplanting, extra preparation of the ground and a little nursing and petting afterwards, for if you have and admire the best and most beautiful in all that goes to make up a perfect landscape, the hard maple will liberally reward you for the care and labor necessary to grow it in perfection. To grow good hard maples the soil must be moderately rich, deep, cool and moist; it will not thrive in dry, hot sand; it must be transplanted either late in autumn or very early spring. If the soil is sandy remove three or four cubic yards and replace with clay loam. A description of each tree, their habits and peculiarities would make this paper too long.

The size of the grounds, the shape and arrangement of the buildings must be studied to determine what is best to plant. As a general rule at least two-thirds of the ground should be unbroken lawn, free from trees or shrubs of any kind. The lowest growing trees should be planted in front and nearest the house; most people make the mistake of planting too many large growing trees. Another thing to be studied is the view beyond your own grounds; study how far you can use the good things of your neighbor and make them add to the attractiveness of your own grounds. For instance your next neighbor has a few beautiful trees, but some unsightly out-buildings, arrange your own trees so as to screen the out-buildings and give you the benefit of the trees. Let the lawn space be widest towards the house or street; do not use shrubbery promiscuously over the grounds, but group them together; do not have many flower beds and those you do have arrange with regard to the shrubs and trees adjoining; avoid the use of statues, vases or rustic ornaments, except in shadowy places; there are places where a rustic ornament, a pile of rock-work, or something of the kind may be used effectively, but such places are not common. A fountain on a quarter acre lot, or a dray load of rocks on a lawn of a few dozen square yards is scarcely in good taste.

Ornamental hedges can often be used to advantage. The finest hedges in the State are made with the Norway Spruce. It is a hardy, thrifty, compact grower, with an abundance of fine, rich dark-green foliage, bears shearing well and can be trained in any desired shape. The Arbor Vitæ and the red cedar are both used for hedges with good results. For a deciduous ornamental hedge the common purple lilac is very nice, making a compact hedge; the foliage is abundant and rich in color and it flowers in profusion. The common wild plum, planted thickly and kept sheared in shape, makes a fine hedge, that will show a pretty bank of snowy blossoms in May. Climbing vines are often used with good effect; the hardiest and most successful climbing plant is the Virginia Creeper, (*A. Quincifolia*;) this is a very free climber with abundant foliage, that colors finely in autumn; it is very easily increased by layers and would be used much more than it is if people generally understood how easy it is to propagate it, and the little care required to grow

it successfully. The Bitter Sweet is a fine hardy climber, with very heavy, dark green leaves; it also has a profusion of berries that hang on all winter; they are a bright orange or scarlet, growing in clusters and look very pretty. The climbing honeysuckle or woodbine, is another hardy, pretty climber that flowers freely in June and July. Wild grape vines, also Clinton, Oswego and some other sorts are good to cover summer houses, trellises, screens or dead trees.

TRANSPLANTING EVERGREENS.

The same general directions will apply, except that the season for planting is, in Minneapolis, from May 15 to June 20. The exact time when they would do best would be just as the terminal buds begin to burst. The tops will not require much cutting, but the roots must not be exposed to the direct rays of the sun, not even for a few minutes, their resinous substance being easily coagulated by light or heat, and once changed it can never be restored.

DISCUSSION.

Mr. Kellogg. Mr. President, I apprehend we have forgotten all about what the vice president said. I could refer to my notes, and call for a good many questions, but this last paper and the other valuable papers that have been read this evening I think will be more profitable to discuss for a time than to go back.

Mr. Sias. Did I understand Mr. Smith to say that his deciduous trees were all native except the last six?

Mr. Smith. Yes.

Mr. Sias. I would like to inquire if you consider the Bird Cherry a native?

Mr. Smith. Yes; I found the Bird Cherry bearing in Wabasha County twenty years ago.

A Member. What time would you transplant trees that are ten to twelve feet high?

Mr. Smith. I would move them just as the terminal buds were swelling, in the spring.

President Smith. That is the right time for trees ten to twelve feet high, but in transplanting trees that are twenty-five or thirty feet, you want to take them up in the winter with a bunch of dirt. Moving with a pile of frozen dirt is all right, but it is very hard work, and it is expensive.

Mr. Bunnell. I was talking to a gentleman last night about moving trees; he said he moved some in the winter, set them in the holes, and every one of them died.

Mr. Smith. More than that, they should be heavily watered, when they are set out. They should not be allowed to stand long from the

time they are taken up. A man going into that must provide some fresh dirt that isn't frozen, and put on plenty of water.

Mr. Pearce. Mr. President, there is one objection that I have to setting large trees. Unless they have been transplanted two or three times, it is impossible, if they are very large, to get them to do well. There are not roots enough. In ninety-nine cases out of a hundred the internal part will be dead while the sap is alive, and as soon as you check the growth of the elm or boxelder, or any of these shade trees, the borers will set in; the moment the heart of the tree is dead the borer sets in. They have destroyed more trees than all other causes put together. Whoever advocates setting large trees makes a great error; that is, speaking of shade-trees. By taking them up in the winter one may accomplish something. Where a tree has been transplanted two or three times, if it is four inches through, it is as sure to live as a seedling an inch thick. But I speak from experience in saying it is almost sure death to transplant large trees. They tried it in Rochester; and I think the gentlemen of this city have found it so. A small tree, a one-inch seedling, is as large as a person should ever set. And when it comes to evergreens, I never want to set an evergreen that is over three feet high. You may set one of these large ones and in order to make it live, you must cut off the large limbs and the lower limbs. A small one retains all these limbs, and makes a symmetrical and beautiful tree. The hard maple I believe is one of the handsomest trees we have, but at the same time, if set where it is liable to be tramped and the leaves gathered and burned, it is almost certain to die. A friend of mine at Lake Minnetonka had a fine grove of hard maples. He trimmed out the dead limbs, cut out the old trees, burned the leaves and tramped the ground; and he said to me, "Pearce, why is it the hard maples all die, the top of every one is dead?" Said I, "You take the life out when you burn the leaves." If you put the hard maple where the surface of the ground would always be covered with leaves, it will live as long as any tree. The roots of a white oak tree run down, and you can never kill them by tramping.

Mr. Harris. I have a different opinion as to tramping not killing the white oak; I know that tramping is very fatal to the black oak; I have known them to be killed by cattle tramping around them.

Mr. Pearce. Those were the red oak?

Mr. Harris. Yes, and the black oak, on my own place.

Mr. Elliot. Speaking of lawns, I think Mr. Smith has allowed a pretty liberal amount of blue grass seed and clover for seeding.

Mr. Smith. I guess that is pretty large.

Mr. Elliot. Instead of ten pounds of clover I would only use about two. The finest lawns we have in this city are made entirely with blue grass. Many have come to me wanting to know why their lawns died out. It is because they throw out their slops and dirt on them, and keep them filthy. If they would give them protection and run over their lawns regularly every night they could keep them looking well.

Speaking about transplanting trees, I think Mr. Pearce is right in regard to transplanting very large ones. I have been in the habit of transplanting trees all the way from six to twelve inches through and twenty-five feet high. Such trees, if taken up with a pile of dirt, and handled properly, one may succeed in making live; but if one takes up a tree ten to twelve inches through with a pile of dirt four feet square, exposing that pile of dirt to the air for one month before setting, what can you expect? You will have a pole the next year without any foliage on it. Our park commissioners have been criticized this evening with regard to the planting so largely of elms. Now, I happen to know why they planted so many, and the reason was they could not get other trees that were suitable. They sent to Illinois to get those elms. They hunted all over Minnesota for them first. There were no trees of that description here. They got trees from two to four inches through. Those trees when they came out of the cars had a mat of fibrous roots. They were shipped the same as to-night and to-morrow they were here, and the next day they were hauled away and proper care taken of them. Out of all those trees, I don't think they have lost three to a hundred. I know at our park they have only lost four trees. They have the maple, the linden, elm, ash and boxelder, and they are all doing well. It is because they have been nicely handled. And that is the secret of planting trees; it is in the handling.

Mr. Smith's idea of taking out a cubic yard of earth in transplanting large trees is a good one, but if the soil is very sandy it should be four times that. I have been somewhat amused to observe our people where they have been cutting down their streets take off all the surface soil, haul it off to fill up some hollow, and leave nothing but a sand pile on which to plant their trees. They go and dig out a bushel or two of dirt and plant the tree. You may expect the tree to live the first year, the next year begin to look sickly and about the third year die. And they then wonder why it is dead. Well, if we were to take our children and give them the same fare, I don't think we would raise

many of them. I have been making a practice of cutting down and digging a hole ten to twelve feet broad, and three to four feet deep in which to plant my trees. Then it has something to feed on. The roots will extend under the street, and it can run up into the lawn and get feed there. I think if we looked at this idea of planting trees in a common sense way, we wouldn't have so many failures. Five or ten feet across and four feet deep is the way I want it fixed on the street.

I don't know of anything that has interested me more than this paper. I would say it is about as correct as anything I have seen for the treatment of street and lawn planting. We have given this subject too little attention. Heretofore we have devoted the large proportion of our time to the apple and other fruits, and I am glad to see that we are coming back to our senses and trying to ornament and adorn our homes and make them pleasant and beautiful.

Mr. Smith. I am sorry the paper is not better, but having read in one of the reports what Mr. Pearce said in regard to the hard maple to the effect that for all the shade trees for planting in Minnesota there was nothing equal to the hard maple, I had rather expected a little more endorsement from him.

Mr. Pearce. Well, gentlemen, there are a good many strange things in this world after all. That was in regard to planting hard maples for a sugar plantation; but I will say to-day that if you want shade trees on the prairie and want something very nice, you will get ten thousand of those little hard maples, at about two dollars a hundred, in place of putting in the cottonwood, plant them on ten acres of ground and afterwards you will thank me for it.

Mr. Elliot. I don't think you can plant any tree with a large leaf on the prairie, and expect it to live. Even the boxelder won't live, nor the ash, and all those kinds of trees outside the willow and cottonwood, you may just as well give up trying to grow, first as last.

Mr. Pearce. Those little hard maples, a foot high, planted thick, say a foot apart, will grow. I set them seven years ago at Moorhead, and I could go there now and show you the handsomest grove there is in that whole country.

Mr. Barrett. In the locality in which I live we make a success with the boxelder; we can abuse that tree more than any other and have it survive. The Minnesota Pine is a failure. I have tried it three years. The lombardy poplar is very unpopular with us, also the white poplar, and the silver leaf. On the level ground it seems to blight, and the tree dies. There are certain influences at work there

that would apply in this locality. One Minneapolis gentleman speaks of us out west as if we were as much advanced in these methods as you are here. We don't claim to be behind the times otherwise, I guess we are abreast, but in this matter I do not think we are. But we have to contend with those terrible winds where a man can hardly stand up, and yet is obliged to work and travel. Doubtless that accounts for the fact that a great many of our people do not make these things a matter of study; and while they are not indifferent to these things they do not study to understand what they ought to do, and they fail, in a measure. We have made a success in growing the boxelder and the white elm. We are succeeding to a limited degree, with the Norway Spruce and Scotch Pine; the Austrian Pine is a failure. I can give very few instances, indeed, where they have succeeded at all. One of my neighbors living in the vicinity of the town had quite a variety of evergreens. He set out a large quantity of them; I think about a quarter of them are alive. Last summer a gentleman representing some eastern nursery was through our locality with a large quantity of evergreens, beseeching our citizens to buy. They did buy. They asked me my opinion. Said I "They have got to die." And my prophecy proved true. There is just one solitary tree that is still alive, which may possibly live through the winter. The Hackberry is a perfect failure with us.

Mr. Smith. Perhaps it is better to substitute White Pine for Scotch Pine. But in making a success or a failure of these things it is a good deal in the man. Mr. Elliott, won't you please tell us that story of your trip to Duluth for evergreens; tell us how many you got, how long it took, how you handled them, and how long they lived?

Mr. Elliott. I have told it so many times it has got to be an old story. I think it was thirteen years ago, I started from here on the 29th day of May, and went to Duluth. The way I happened to go there was, the year before I went up there and while wandering around I saw a nice chance back of the bluff for getting a few *Arbor Vitae*. Also I noticed a swamp, at Moose Lake station, where there was any amount of spruce. I was also acquainted with a man at Superior City, that had dug some trees and shipped them, and there was a swamp of white spruce near there. I started on the 29th of May, in the night, got to Duluth the next morning about six o'clock and went to the hotel. Breakfast was not ready, and I thought I would take a little stroll up on the bluff. After a little I went back and inquired where I could hire a man; I found a man to help me, and we

went up there, and with our hands we pulled out the trees putting them into bundles and packed about twenty thousand Arbor Vitae during the day; at six o'clock at night I had them on the train. I came down to Moose Lake station, switched off there for the night. The next morning we hitched to a hand-car, got a man to run me up to the swamp, where I got about three thousand balsam and spruce; arriving home with the trees the next morning. I had over twenty thousand trees. Instead of planting those trees as many do when they get forest trees, I placed them just as close as I could, right along in rows, about four or five inches apart; some of them were three or four inches, and from that up to a foot high. We kept them in water all the time, and after they were packed in that shape, we drove stakes in the ground, had strips of boards and poles fastened or arranged in such a manner as to keep the trees moist all summer. I let those evergreens stand there for two years. When I transplanted them I didn't lose five per cent. I have some of the trees out here at my place, that are fifteen to eighteen feet high. Some of the Arbor Vitae that I got are left yet, five or six feet high, and are nice evergreens. That is the way I handled them, and that is the way I got them.

President Smith. I wish to say in regard to transplanting large trees, that I do not advocate the setting out of large evergreens; while it can be done, I certainly would set small trees every time, of both the deciduous trees and evergreens.

On motion, the meeting adjourned until Thursday morning at nine o'clock.

THIRD DAY.

THURSDAY MORNING, January 21, 1886.

The meeting was called to order at nine o'clock by President Smith.

The Annual Report of the Secretary was then read:

THE SECRETARY'S ANNUAL REPORT.

Mr. President and Fellow Members:

In presenting this our first annual report as Secretary of the Minnesota State Horticultural Society, you must be congratulated upon the very auspicious circumstances that surround us, not only as members of this Society but as citizens of this great and growing commonwealth; upon the material advancement and prosperity which have characterized our labors, and the goodly degree of happiness which it

has been our privilege to enjoy. We have been favored with fruitful seasons; abundant harvests of wheat and corn, and been provided with bountiful supplies of choicest fruits of nearly every character and kind. And while other lands than ours have suffered in notable instances from the ravages of war, famine, or pestilence, we as a people have been favored with the blessings of peace, prosperity and plenteousness. Losses from heavy storms, disastrous floods and destructive cyclones have happily been averted within the borders of our own State during the past year, and there are abundant reasons for heartfelt gratulation to the Giver of all good for the many blessings that have been bestowed upon us.

It is a fact well understood that the larger portion of the people of Minnesota are engaged in agricultural pursuits and that the farming industry lies at the very foundation of our wealth and prosperity. And while it is true that those engaged in other avocations contribute their proper share, still to the well-directed efforts of the farming classes are we mainly indebted for the real progress made in a material point of view.

The staple productions of Minnesota are chiefly those of the farm, consisting of wheat, corn and other cereals; of cattle, horses, hogs, etc., the combined value of our products for the year 1885 being considerably more than eighty millions of dollars. There has been marked advancement in some departments of farm labor within a recent period, which may be cited as an indication of the progress being made; as for example that of dairying, which as a leading industry of the State, has grown to vast proportions within the last five years.

No one will question the statement that our people in the pursuit of their various occupations are as a rule, active, earnest and wide-awake; and it is no exaggeration to say that our industrial classes are generally intelligent, practical and thorough going in their work and several callings. This is, perhaps, but natural and almost necessarily the result in such a climate as that which Minnesota affords, where the atmosphere is so remarkably pure, bracing, exhilarating and healthful; where our summer seasons are comparatively short, and the growth of vegetation in many instances so remarkably rapid and luxuriant.

But while no one will question or deny the rare fertility as well as great productiveness of our Minnesota soil, it is also a fact which cannot be disguised that there are certain disadvantages, or drawbacks to be contended with which need to be most thoughtfully considered by our best statesmen, by every toiling farmer and laborer as well. One thing to be deplored is unremunerative prices which prevail for various commodities here produced, denying to the husbandman an adequate return for labor necessarily bestowed. We come in competition with foreign grain because of low rates of transportation by rail and by ocean steamers. Russian and Indian wheat find ready market at leading seaports of the western world, and at the same time statistics indicate that our production of the cereals is steadily increasing. As one result of this condition of affairs, farmers throughout the State are now diversifying their industries to some extent, instead of growing and depending wholly upon one leading, staple article, that of wheat. They are directing their attention to stock raising and dairying, and other methods of diversifying their labor. The measure of success attending this new venture has thus far proven quite satisfactory. There is, however, need of further change, for we must recog-

nize the need of growing our own fruits; we must as far as possible supply our luxuries and our necessities, here at home.

OUR NATIVE FRUITS.

I scarcely need remind you of the fact of the superiority of our home grown fruits as compared with products shipped us from the southern states and warmer latitudes. No finer flavored grapes, or strawberries, are produced than such as are or may be grown in Minnesota in great abundance, with proper care or skill. As yet, but little has been done in this direction. We cannot half supply our local markets now as we may do when we have learned the best and cheapest method of care and cultivation. In this regard to educate, point out, and recommend the wisest plans to be pursued, should be the mission, aim and work of our Society, at least to more or less extent.

There is no doubt that horticulture in our State has heretofore been characterized with failures, difficulties, and losses of various kinds, well nigh sufficient to try the stoutest heart, and not a few perhaps at times have been discouraged; but there is room at present for hope of better things and brighter days to come. The work of this Society, perchance, will not be labor lost, or spent in vain. Those members who have all these many years been planting trees, experimenting and testing various fruits, will not give o'er the struggle yet awhile; we trust their fondest visions in the past may yet be realized at least in part.

STATISTICS.

According to the reports of the State Commissioner of statistics the number of apple trees growing in the State in 1884 was 779,699; in 1885, 789,080; in bearing in 1884, 301,455. The number of bushels of apples produced was 36,082 in 1874; 52,555 in 1875; 64,538 in 1876; 75,736 in 1877; 89,922 in 1878; 124,261 in 1879; 147,803 in 1880; 158,058 in 1881; 176,038 in 1882; 180,736 in 1883; 173,357 in 1884. It will be seen that the number of bushels reported has steadily increased from year to year, but is in the aggregate far disproportionate to the amount which should be annually produced. The same report returns the number of bearing grape vines in the state in 1884 at 75,334; in 1885 80,352; number of pounds of grapes produced in 1883 at 152,678, and in 1884 the amount returned was 259,404 pounds.

The counties in the State which in 1884 report above ten thousand trees in bearing, are: Carver, Dakota, Fillmore, Goodhue, Hennepin, Houston, Le Sueur, Olmsted, Rice, Wabasha, Winona, and Wright. Fillmore county reports the largest number of trees in bearing, being 25,379, with Olmsted county next, reporting 20,378 bearing trees.

The largest productions of grapes was reported from the counties of Hennepin, Houston, Ramsey, Wabasha and Winona. The number of pounds of grapes reported from Hennepin county, for 1883, was 32,295.

Now, this exhibit plainly indicates that raising fruit in Minnesota has not as yet become a leading industry; and it suggests the pertinent inquiry how shall we measure up and reach the wished-for standard? Have not the people been too lax in this regard?

SMALL FRUIT CULTURE.

While it is true that orcharding has been neglected to some extent it may be

said that *small* fruit culture has rapidly developed, and those who claim to know whereof they speak affirm it pays a liberal return. We have no accurate data concerning just the quantity of berries raised in Minnesota, suffice to say, the quantity of strawberries alone, produced in 1885, was several times as great as that of three to five years since. The little patches planted here and there have grown to acres in many instances, producing large and paying crops of luscious fruit which finds a ready market here at home.

In this connection it may be proper to inquire if this Society should not give some attention to the discussion of all the various methods to be used in order to encourage and promote this profitable and pleasing industry—the cultivation of small fruit.

THE PAST YEAR

In some respects has been a trying one; perhaps the most disastrous to fruit trees ever yet experienced. The losses are, however, not confined to northern latitudes. Fruit growers hundreds of miles below the southern limits of our State are bitterly complaining. Reports that reach us from Ohio, Illinois, Iowa, Wisconsin and other states would seem to indicate that losses have been great in all these different sections. For example, an estimate of fruit trees in northern Illinois, reported as dead or in a dying condition, presents the following result: apple trees, 56 per cent; pear trees, 65 per cent; peach trees, 95 per cent. This somewhat new and phenomenal experience has disarranged to some extent the well-established theories entertained and put in practice heretofore, concerning hardiness and ease of propagation of certain kinds of standard trees. But while with us there may have been a greater loss of apple trees than heretofore, it also may be said that this result was not entirely occasioned by the extremes of cold experienced last winter, when the thermometer in some localities at times, perhaps, dropped down among the fifties. It is believed by some that the continued warm and almost sultry weather experienced before the cold set in had more to do with the loss of trees than any other cause. Some instances are mentioned where trees were out in bloom just at the time when properly they should have been in good condition to enter "winter quarters."

As to how far exposure, improper methods of protection, heat and cold, diversity of soil, as well as lack of proper care, or cultivation, have each or all conspired to bring about the loss referred to, we leave with others to determine; suffice to say we must again revise our systems, plans and modes of culture, if we are ever to succeed in growing fruit. The lessons of the past remind us surely it is no "royal" road that leads on to fortune; we need to marshal all our forces and bring to bear the best experience, the highest measure of intelligence and skill. The very general loss of trees experienced should not discourage wholly nor cause us even to relax our efforts in the least. Of course the chances lessen, and difficulties in the way are much increased, where such extremes of temperature are found; where drought and scorching heat prevail to some extent in summer; where heavy winds and storms some times are felt. And yet, despite these drawbacks may we not pursue a course which in a measure will enable us to overcome them and gain an ultimate success at last? It is a vital, all-important question whether we shall give the battle o'er or fearlessly press on to meet and overcome the obstacles which

seem to block our progress and partially hedge up our way. We scarcely need to call attention here to what has been accomplished, or bring to mind the tedious processes by which we have secured the present vantage ground. You know full well the value of

OUR MINNESOTA SEEDLINGS AND SO-CALLED "IRON CLADS."

It would be difficult to estimate the time and money spent originating healthy, hardy trees, and such varieties as would withstand severest tests of every kind, and still afford us fruit of pleasing quality, of proper size and keeping merits. In this regard we have not yet attained our object fully although much progress has been made. The merits of our Wealthy apple are much extolled abroad; we proudly point to that and many other home-grown sorts, of less or greater promise. But still it is an open question how far we may succeed in propagating Minnesota seedlings, a subject well deserving close investigation upon the part of all, and one which may elicit much and profitable discussion at this session.

RUSSIAN VARIETIES.

We wish to call attention briefly to the subject of the propagation of Russian varieties of apples, and to review the testimony, to some extent, for and against their introduction. It seems to us this is one of the most important subjects which can be brought before this meeting for our consideration.

Much interest has been shown of late, by many persons in gaining all the information to be had concerning the adaptation of these fruits, both to our soil and climate. The merits of the so-called new Russian sorts, have been unduly magnified by some, while they have been condemned upon the part of others. All the discussions on this subject have taken a wide range; we cannot stop to give more than a passing notice to what has recently been said and written in regard to introducing Russian fruits. It would seem quite important at this time, however, that we should carefully examine upon the evidence, pro and con, in order that we may determine what the true facts are in the future and act accordingly.

Upon this subject of the comparative merits of Russian varieties of apples, we may refer to the discussions had at the annual meeting of the State Horticultural Society of Ohio in 1884, where the question of "practical experience with Russian apples" was under consideration. It was contended on the part of some of the members of the society that for the climate of Ohio, and especially as far as the fruit growing regions of the Western Reserve were concerned, that the growing of Russian apples was unnecessary. Others took the position and argued strenuously in favor of planting and giving them a thorough trial. It was claimed that in central Ohio they had withstood the storms, snows and frosts for ten years past, without material injury, where many orchards were producing thousands of bushels of these apples, as fine as are to be found in the market, while at the same time many of the leading native varieties had been entirely destroyed.

Mr. Saunders, president of the Ontario Fruit Growers Association, and Mr. Beadle, a member of that society, being present, took part in the discussion referred to, and were called upon to relate their experience with Russian apples in Canada.

President Saunders said: "Our purpose in introducing the Russian apples is not to give them to the people who can grow the better apples; but to those only who reside where the common varieties will not succeed; and I can easily understand

that the large dissemination of Russian apples among your people of Ohio is more likely to result in injury than benefit."

Mr. Beadle stated that his observation and experience had taught him to make haste slowly in propagating Russian apples and not to embark in the enterprise by the wholesale. Where such standard apples as the Baldwin, Ben Davis, Rhode Island Greening, the Russet and other familiar varieties could be grown, there was no occasion to make a change, they were more highly flavored, more valuable in every way than any of the Russian apples that he had seen. So far as his observation had gone they were not as highly flavored as the American apples. He recommended, however, the growing of Russian apples in portions of that state where the summers are dry and very hot, and the winters are cold and dry. Among the varieties which had succeeded well in the vicinity of Ottawa, he mentioned the Alexander, Red Astrachan, Duchess and Yellow Transparent. In this connection he mentions the Wealthy as being originated by Mr. Gideon, of Minnesota, and a variety that had succeeded well with them, and thought it would take the place of the Baldwin in places where that variety would not grow abundantly.

Mr. Albaugh, a nurseryman, who had had twenty-six years' experience in the Miami Valley, stated that there were more fruit trees grown in that valley than in any other diameter of twenty miles in the world, and that the Duchess succeeded there first rate, also Yellow Transparent, for an early variety. He advised planting plenty of the new Russian varieties, as they withstood the rigors of the climate when the old varieties would not.

The fruit growers of Kansas seem quite averse to recommending Russian varieties of apples, judging from action taken by the Horticultural Society of that state. At the semi-annual meeting of that society, held in June, 1884, a resolution was adopted to the effect that none of the Russian apples are worthy of cultivation, except the Duchess, Red Astrachan and Tetofsky, which should only be planted sparingly for family use. One speaker quoted Prof. J. L. Budd, of Iowa, one of the very best authorities upon this subject, as having written him as follows: "Where such fine apples of the American varieties grow and bear such fine specimens as they do in Kansas, don't trouble with the Russian varieties."

At their annual meeting in December 1884, a resolution was offered that, in the opinion of the society, all the Russian varieties of apples are unworthy of general cultivation in Kansas and should be stricken from their voted fruit-list; and that report indicates the adoption of the resolution by a vote of 17 to 5.

The brief report given of discussions upon the foregoing resolution indicates a purpose on the part of the society to defeat the efforts of the swindling tree peddlers rather than to condemn the introduction of true Russian fruits.

Mr. Cutter, of Junction City, in opening the discussion, contended that great damage had been done to the fruit interests of Kansas, by the sale of hundreds of thousands of comparatively worthless Russian fruits at extortionate prices. He referred to the "smooth-tongued tree peddlers" who, usually being strangers from abroad, are compelled to work, steal or starve; and who sometimes are wont to choose a half way course between the first two. He argued to show from this standpoint a doubt or positive denial of the value of the Russian fruits for Kansas. He refers to a statement by E. J. Teas of Dunreath, Indiana, who writes under date of November 1884. "There is not one of the Russian varieties of apples

tested in this State, or so far as I know, in the Union, that has developed qualities that entitle it to pre-eminence. I believe the best are the Duchess and Red Astrachan, and possibly the Alexander." He refers also to a letter received from Elwanger & Barry, of Rochester, N. Y., under date of November 29th, 1884, in which they say: "We have fruited a great many of the Russian apples so-called. This season we have Peter the Great, Titorka, Ananasnoe, Belborodoskoe, Arabskoe Kapsnoi, Limnoi, Antonooka, Ostrowskoe, Tschencoe, Drewe, Nicolager, Anise, Nova, and others. Some of these are fruits of great size and fair looking, but we have not had experience enough with them yet to be able to say whether any of them will be valuable keepers; we are inclined to think not, here. They may be of value in severe north and northwestern climates. We must give them a fair trial." Mr. Cutter concludes his paper by adding: "Therefore we have no room to hope for anything from Russia but a lot of summer and fall cooking apples."

In Iowa the value of Russian varieties of apples has been brought before the meeting of the Horticultural Society of that State from time to time and many interesting facts elicited. Mr. Van Houton, of Bedford, in an able paper on orchard management, says upon this subject: "The unqualified reliability of the Duchess and the high promise of other Russians renders it certain that we will get many profitable varieties for general planting all over Iowa, but the introduction of the newer kinds is in the hands of experienced Horticulturists, and the beginner should await their decision before planting and avoid buying of glib-tongued tree peddlers, fancy-priced Russian varieties." The experimental grounds at the agricultural College, under the careful management of Prof. Budd, with the experiments under way by our best Horticulturists will bring to the front the best."

President Speer, in his annual address before the society, observes "A careful examination of the wood or cuticle which covers the bark and the bud-scales of the Duchess and other truly iron-clad trees will show that they have been designed to guard against vitrefaction in a very cold, dry climate. Many of the Russian varieties of the apple, cherry, etc., have such qualities and also have thick leaves which have a greater number of empty guard-cells on their upper surfaces than the smaller and thinner leaves of American and west European varieties."

Upon this subject we may cite one more authority, referring to the report of Mr. Hayaland, of Fort Dodge. In speaking of extreme climatic changes and the severe cold experienced in that locality, he concludes that a favorable opportunity was offered for a comparison of the endurance of Russian and native varieties, and adds: "judging from the color of the branches of last season's growth we find the following numbers compare favorably with the Wealthy and Duchess: 367, 153, 8, 323, 402, 369, 563, 98, 206, 48, 167, 181, 177, 181, 333, 418; and the following not as hardy as the above, are about like the Haas and Yellow Transparent; 10, 371, 164, 183, 467, 382, 202, 393, 378, 874, 277, 12, 290, 230, 856, 399, 4, 128, 122."

I will not trespass upon your time further by citing the opinions advanced by fruit growers in Wisconsin and our own State who have had practical experience in growing Russian fruits. We hope to get a very fair expression of their views at the present meeting, and trust that they may furnish the added weight of experience gained during the past year, when conditions have changed so very materially in many instances, in regard to the propagation and growth of fruit trees of every kind.

EXPERIMENT STATIONS.

Mr. President, I trust this meeting will not adjourn without action being taken looking to the establishment of some definite plan whereby the members of this Society and others may be enabled to receive the benefits to be derived from actual experiments made from time to time by practical horticulturists; that proper plans may be devised and provisions made, whereby not only theoretical but practical horticulture may be promoted in this State. I refer, of course, to experiment stations and the character of the work to be undertaken and thereby carried on. The efforts heretofore put forth in this direction have been effective for the objects had in view and much has already been accomplished, but there is need of more systematic effort being made and better methods being used to make these stations all that could be wished.

Upon this general subject I would call attention briefly to the matter of agricultural experiment stations as showing what is elsewhere being done in this direction. Prof. S. A. Forbes, at the annual meeting of the Illinois State Horticultural Society, in December, 1884, presented a report to the Society in which he says: "Agriculture has been preeminently esteemed by all civilized nations from the earliest times, because it is recognized as the foundation of wealth and progress. It has also been favored by governments because the art is essentially experimental in nature and practice, and the benefits of the experiments reach the whole people, rather than enrich the individual. As the processes of agriculture become scientific and rational rather than empirical and traditional, the value of experiment and investigation becomes recognized and new knowledge is not only tolerated but is more and more sought for by practical men."

Reference is made in this report to the valuable investigations made by Boussingault, of France, and to those of Justus Liebig and others, of Germany, in the earlier portions of the present century.

The first agricultural station regularly established in America was in the state of Connecticut in 1875, since which time stations have been established in North Carolina, New Jersey, New York, Massachusetts, Ohio, Wisconsin and California.

In 1877 the Connecticut station was permanently established in connection with Sheffield school, a department of Yale College, and an annual appropriation of \$5,000 made for its support, which was increased to \$8,000 per annum in 1882. The most prominent work of the station has been the analysis of commercial fertilizers sold in the state. It is said that very great improvement is attributable to the work of the station. Bulletins are issued from time to time showing the results of experiments made in testing seeds, the physical properties of soils, the relative value of foods, etc.

In North Carolina the experiment station was established in 1877 and about \$7,000 is annually expended. The work of the station is mainly devoted to fertilizers and soils, but attention is also paid to seeds, feeding-stuffs, waters, rocks, etc.

In New Jersey the station was founded in 1880, in connection with Rutgers College, the sum of \$11,000 being annually appropriated by the legislature, while the college furnishes the laboratory and other necessary buildings. Most attention has been given to the analysis of fertilizers, but much to feeding and field experiments.

The New York agricultural station was founded in 1881, a state appropriation being made of \$25,000 for land and buildings.

In Massachusetts the station was founded in 1882, \$5,000 being annually appropriated. It is located at Amherst, the laboratory and about eighteen acres of land being furnished by the college at that place. Among subjects of investigation are fertilizers, plant diseases, stock feeding, insects, etc.

In Ohio the experiment station was established at the State University in 1882, \$5,000 per annum being appropriated for expenses. The experiments both in the field and laboratory deal with grain raising, stock raising, dairying, horticulture, forestry, etc. Bulletins are prepared for the agricultural press and annual reports are printed at the expense of the state.

In Wisconsin the experiment station was established in 1883 and connected with the State University. The farm, consisting of 125 acres with barns, dairy, fruit plantations, etc., which belong to the department of Agriculture of the University, are all at the service of the station. About \$6,000 are annually expended. The scientific corps of the station consist of the professors of agriculture, botany and chemistry, with one assistant. Bulletins are published from time to time and annual reports made at the expense of the state.

In California the experiment station is supported by direct provision of the legislature and is connected with the agricultural department of the State University. About fifteen acres of the University farm are used, and about \$7,500 have been expended in fitting up the grounds and the laboratory. Attention has been given to the analysis and classification of soils, irrigation and to viticultural investigations. Annual reports are made and weekly bulletins sent out to the agricultural press.

In Georgia a small experiment station has been established at Athens, and grounds have been purchased and fitted up at an expense of \$30,000. Chief attention is paid to cotton and cotton growing.

As to what is being done in this line of work in Minnesota I refer you to the very interesting report of Prof. E. D. Porter, in charge of theory and practice of Agriculture, at the State University, and superintendent of the State Agricultural farm.

In the report alluded to Prof. Forbes defines the agricultural station as "An agency intended to determine the conditions of the best success in agriculture under existing circumstances, applying to the numerous and complicated questions involving the strictest methods of modern science, and putting the results arrived at in so clear, definite, and exact a form that no intelligent farmer can fail to comprehend them, or refuse to acknowledge their force. It substitutes skill, method, accurate record, elaborate scientific experiment, for the irregular, indefinite, uncertain, inaccurate, hap-hazard individual method of agricultural observation and experiment now generally prevalent."

What has been said upon this subject would seem to indicate the necessity as well as utility of experimentation, not only in departments of agriculture in general but also in horticultural work and investigation. In this age of wondrous inventions, important and often startling discoveries, we want more specialists,—those who make a particular subject a study, and who, after becoming thoroughly informed themselves, may readily impart information to others.

If the State of New York can annually appropriate and expend the sum of \$20,000 for judicious and profitable experiments to be made by their agricultural station may there not be need of provision being made for corresponding work in Minne-

sota? And, further, should not something be done each year by this Society and its executive board, to aid in experimental work?

Among possible lines of investigation which might be named are, protection from contingencies of climate; the effects of drought; averting injuries from scorching heat, from storms in summer and disastrous frosts in winter; originating new varieties of the hardiest, healthiest and best kinds of fruit trees, plants, flowers, vines and shrubbery; (casting out the worthless and unworthy,) studying the nature of plants, their diseases, their acclimation and methods of cross-fertilization; the habits and influence of insect life upon plants and fruits, and carefully noting the results.

It may be said and to the credit of this Society, that its officers and members are deeply interested in the work which they have undertaken. They recognize the nature of the multitude of difficulties to be met and overcome. The record made already in the past in many aspects is a cheering one, and better things are hoped for in the future. In order to avoid mistakes and make substantial progress in the work we have in hand we want united action; our methods need to be both practical and plain. We seek to gather information everywhere and profit by experience, time and labor spent by kindred state and local organizations similar to our own.

LOCAL HORTICULTURAL SOCIETIES.

As indicating the increasing interest taken in horticulture in this State, it is but proper to refer to what is being done by local organizations. Of these societies there are quite a number in existence, and doing a good work. One new society has been established recently at Granite Falls, and it is gratifying to observe the progress being made in various portions of the State in active, earnest, thorough work. Without designing to repeat or in the least infringe upon the very interesting report already handed in, we wish to call attention to the very creditable record made by the Hennepin County Horticultural Society and Gardener's Association, and more especially in connection with its second annual fair. This organization has but recently been founded (that is a couple years ago,) but has already gained deserving fame abroad. There is no question that it is accomplishing much which will be of lasting benefit to its many members as well as others, by its experiments, its meetings and discussions and various methods used and recommended. In this connection, as showing what is being done, we quote the following, taken from the St. Paul Pioneer-Press, descriptive of the opening of the second annual fair, occurring September 22, 1885:

A REALLY SUPERB DISPLAY.

The second annual fair of the Hennepin County Horticultural society and Market Gardeners' association opened yesterday at the new Brackett block, corner of Second street and First avenue. As is usual on such occasions, the first day was really devoted to the arrangement of the various exhibits, but enough were in place last evening to prove that the fair is the most successful of its kind ever held in the county, and the display of fruits and vegetables surpasses that witnessed at any meeting of the State Horticultural Society. The grape exhibit alone occupies a table at least three feet in width and seventy-five feet in length, the major portion of which is credited to the intelligent and enterprising horticulturists residing along the shores of Lake Minnetonka. Perhaps the largest single exhibitor is Mr. A. W. Latham of Excelsior, who has no less than thirty distinct varieties of grapes on the table. He has a vineyard covering eight acres, five of which are bearing, and as one gentleman expressed it, "There are not weeds enough in the vineyard to fill your hat." The moisture and sandy soil of the lake

shore are pronounced exceptionally favorable for the culture of the grape. Mr. Latham's testimony being that the fruit produced is as good as can be grown in the United States but some varieties do not find the season long enough for complete ripening. Certainly the display at Brackett's will more than sustain the above opinion, and shows that Hennepin county has not more than fairly commenced the development of one of its numerous sources of wealth. N. J. Stubbs of Long Lake exhibits thirteen varieties of grapes, including the "Rogers No. 89," a prolific bearer, ripening early, and with a flavor which cannot be surpassed. Mr. Stubbs states that his grapes have yielded at the rate of \$400 per acre each year since he has been engaged in the business. Mr. J. Bost of the same place has fourteen varieties on exhibition, three of which are new, and among the latter the Lady Washington and Jefferson being specially prized on account of their beauty, fruitfulness and the compact and solid character of the individual bunches.

THE DISPLAYS IN GENERAL.

In the department of grapes, apples and other fruits, F. G. Gould of Excelsior makes exhibits which will reflect credit upon any state; including nearly all the varieties of grapes to be found in any latitude or country. Exceedingly fine collections of grapes are also exhibited by J. S. Harris, La Crescent; N. H. Reeves, Minneapolis; J. J. Cale and Charles Gibson, Minnetonka; H. F. Busse, Minneapolis; T. Bost, Excelsior, and G. H. Roberts, Minneapolis. N. J. Stubbs of Long Lake and F. G. Gould of Excelsior are competitors for the \$50 prize offered for the best and greatest variety of grapes. In the department devoted to apples, the destructiveness of the extreme cold last winter is fully revealed. The display is not extensive in quantity or variety, but the quality of the specimens exhibited is excellent without exception. There are only eight entries in this department, as follows: K. H. Whipple, Chowan; J. S. Harris, La Crescent; J. J. Cale, Minnetonka; Charles Hawkinson, M. V. Pratt, J. T. Grimes, H. F. Busse.

AMONG THE VEGETABLES.

The display of vegetables is very full and complete, and a better is seldom witnessed. The gardeners of Hennepin county state that the series of meetings and discussions held during the past winter and spring are reflected in the improved character and greater variety of garden products cultivated during the past summer and now placed on exhibition. Several new seedlings of unusually promising character are displayed in the various departments, all indicating that the horticulturists and market gardeners have entered upon investigations and experiments which promise great and profitable results in the near future. The principal exhibitors in this department are:

G. H. Roberts, Minneapolis; K. H. Whipple, Chowan; J. F. Gilmore, Richfield; Nicholas Hermes, St. Paul; John Lyons, William Lyons, N. H. Reeves and John Hogan, Minneapolis; A. N. Grady, Minnetonka; H. R. Samplugh, Minneapolis; E. Peteler, Shingle Creek; J. T. Woodman, Brooklyn Center; Frank Moeser, Minneapolis; J. J. Cale, Minnetonka; Eli Anderson, Northome, Lake Minnetonka; Nicholas Demuth, Chowan; C. F. Baston, J. J. Baston; M. V. Pratt, J. T. Grimes and Charles Hawkinson, Minneapolis; M. A. Dean, Shingle Creek; J. F. Held and Richard Gray, Minneapolis.

H. F. Busse and John Lyons of Minneapolis are competitors for the premium offered for the greatest and best display in this admirably filled department.

THE POTATO DISPLAY.

There is also a fine display of this common but exceedingly useful vegetable, the principal competitors being G. H. Roberts, H. F. Busse and William Lyons, Minneapolis; J. F. Gilmore, Richfield; A. N. Gray, Chowan and E. Fetter, Shingle Creek. Mr. Roberts exhibits five different specimens of winter and spring; Mr. Gray eight varieties and ten seedlings, and Mr. Lyons' exhibit was not surpassed at the late state fair.

In the class of canned fruits and vegetables the displays are not numerous, the principal exhibitors being M. V. Pratt and Mrs. Mary Lyons, Minneapolis, and Mrs. M. A. Pearce, Minnetonka. Messrs Northrop, Braslan & Co. have an extensive collection of bulbs on exhibition, including different varieties of tulips and double hyacinths, and seeds of all kinds may be found in their tastefully arranged department. The arrangement of the exhibit was not fully completed until last evening, and those who visit the fair to-day will be convinced that the soil of Minnesota can produce its quota of delights, and that beauty, life and wealth are concealed under its fair surface.

It seems to us that something should be done for the encouragement of horticultural work, such as is being carried on by these societies. It takes some time

and money to hold an annual fair, at least the kind above described. Where liberal premiums are paid to those who make exhibits, it is no more than just that the society should have some adequate encouragement and support, the same as local agricultural societies are now supported by the State. A small appropriation from the State would prove of much assistance in holding horticultural fairs.

It may be proper to consider whether this Society cannot materially assist these county organizations in some substantial way. There ought to be a mutual interest felt in the prosperity of each and all. Perhaps some plan may be devised for cultivating still more intimate relations. We recognize the need of their co-operation and support, and we in turn must do our part since all our interests are so reciprocal.

THE ANNUAL REPORT.

The thirteenth volume of this Society's transactions was issued in the month of June. It was received with favor, but published at a season of the year when those who read these publications with the greatest interest have not sufficient time at their command to carefully peruse the same. Among the many notices received in commendation of this number the following may be given:

The annual report of the Minnesota State Horticultural Society for the year ending March 31, has been issued by the Secretary, S. D. Hillman. It is the most complete report yet issued, and contains in addition to the State Society's proceedings, the doings of the Minnesota Amber Cane Association at their annual meeting, and the debates of the Hennepin county horticulturists. The book contains much practical information and is a valuable addition to the horticultural literature of the State.—*Minneapolis Tribune*.

The typographical execution is unusually good, while the contents are useful and instructive. It is full of facts worth more to the farmers than any book they would have to pay ten dollars for. It contains all the proceedings of the Amber Cane Association, with a list of their officers for 1885, as well as those of the State Board of Agriculture. There are 465 pages in the combined work. Secretary Hillman deserves great credit for the able and interesting manner in which he has brought the book before the public. It should be in the hands of every farmer in the State.—*Farm, Stock and Home*

We are indebted to Secretary Hillman of the Minnesota Horticultural Society for a copy of his report for 1885, a neat volume of four hundred and sixty-five pages, filled with the experience of Minnesota's best fruit-growers. As regards apples, the leading tree fruit, the experience is much the same as we get in the cold north-eastern part of Vermont and in the Province of Quebec. Minnesota has sent us the Wealthy, the best iron-clad winter apple, while we have sent her the Scott's Winter, the longest keeper of the same class, and Quebec has furnished the Peach of Montreal, one of the best fall dessert apples in existence. These interchanges, and the general and rapid increase of knowledge in regard to fruit growing are greatly promoted by publications like this report. Many promising seedlings suited to the Minnesota climate are reported as on trial, and the new Russian fruits are having a wide testing, the results of which are full of encouragement, assuring us as they do, of final and entire success in pushing the large fruit culture several

hundred miles farther northward than it has ever gone on this continent heretofore.
—Dr. Hoskins in *Vermont Watchman*.

In the general distribution of reports we have been subject largely to the direction of the Executive Committee. We have endeavored to supply each member of the Society with at least one bound copy of the transactions, and with extra copies in paper covers when requested.

Exchanges have been made with the societies of the following states, to-wit: Wisconsin, Iowa, Nebraska, Colorado, Kansas, Missouri, Indiana, Illinois, Ohio, (Western) New York, Pennsylvania and New Jersey; also with the horticultural societies of Dakota and Montreal, Canada.

In this connection we suggest the propriety of having a larger number of copies of our reports bound in cloth. Five hundred copies are barely sufficient to supply our own members and to make the necessary exchanges. It seems to us we ought to have at least one-half the entire edition bound. The value of the work would then be more fully recognized by those receiving it, and it would find its place upon the library shelf where it would be preserved for years to come, to be referred to conveniently whenever necessary.

The volumes issued by the Society for a number of years past have been creditable productions, and we trust the interest manifested on the part of members in this respect will not flag and that there may be still further improvement made in the character of succeeding numbers.

THE CORRESPONDENCE

which your secretary has conducted during the past year is indicative of an increasing interest which is being taken in horticultural matters generally in this State as well as elsewhere. Extensive correspondence has been had and almost daily letters are received and answered concerning some department of our work. Of course this work requires considerable time to be employed but it is still a pleasing duty to perform. We cannot publish all our lengthy correspondence and yet we ought not to omit what may be deemed of public interest, although our space is somewhat limited. Among the numerous letters which are constantly received are many which should find a place in our transactions. Of these a number will be read or be referred to appropriate committees. One takes peculiar pleasure in perusing letters like the following, received from that eminent and venerable pomologist, the Hon. Marshall P. Wilder, in his own peculiar chirography:

"BOSTON, July 28, 1885.

MY DEAR SIR: Many thanks for the report of the Minnesota Horticultural Society. Like its predecessors it is full of interesting information. Your State has made rapid progress in fruit culture and has become widely renowned for its enterprise and success in this important branch of American Husbandry. It has become an important ally in the labors of the American Pomological Society, and we count largely on its exhibition of fruits at the forth-coming meeting at Grand Rapids, Sept 9th, when the East will come on to shake hands with the Great West. Please send us a full delegation of your noble men.

Yours as ever,

MARSHALL P. WILDER.

S. D. HILLMAN, Secretary etc.

The following sufficiently explains itself:

MINNEAPOLIS, MINN., Sept. 12, 1885.

W. J. Hahn, Esq., Attorney General:

St. Paul, Minn.

Dear Sir:—At a meeting of the Executive Committee of the Minneapolis State Horticultural Society, held on the 10th instant, the undersigned was directed to communicate with you and to ask an opinion in regard to the action of State Auditor Braden in withholding an order upon the State Treasurer for a portion of the annual state appropriation of the Society.

The point upon which the committee desire information is as to whether the Society is entitled to the annual appropriation of one thousand dollars granted to aid the Society, to be expended for such purpose as its Board of Directors may deem necessary and proper?

Section 3 of chapter 72, General Laws of 1881 provides as follows:

Sec. 3. "That the sum of one thousand dollars (\$1,000) be annually appropriated, out of any moneys not otherwise appropriated, to aid the said Horticultural society in the work of distributing their reports, collecting data, specimens pertaining to horticulture, providing a suitable place for its books, specimens and articles of the society, and for payment of salary and expenses of its secretary and committees for labor actually performed by them, and other uses that may, in the opinion of the Board of Directors be deemed necessary and proper. The said sum shall be paid by the State Treasurer on the order of the President of said Horticultural Society."

In order to raise the question fully and to get an authoritative decision upon the same, it may be well to give a statement of the condition of the funds of the Society as shown by the report of the Treasurer as well as the action taken by its Executive Board, since the act referred to has been in force.

At the annual meeting held in January 1882, the President of the Society, in his annual address, called attention to the act of the Legislature and recommended action thereon, as follows:

(See page 43, Report 1882.) "Since the adjournment of our last annual meeting the State Legislature has granted us an annual appropriation of \$1,000. This sum if judiciously used may prove of great benefit to the Society and to the people of the State at large. It remains with you at this meeting to say what disposition shall be made of it. See to it that its disposition shall reflect credit upon us, accomplish the object for which it is designed, and secure for us the confidence of the tax-payers of the State. I am in favor of setting aside a portion of the amount to be used only in the payment of premiums to be offered to encourage the growing of fruits from seeds, the offer to be so guarded as to leave no chance for imposition, and I think that we ought, without delay, to create a committee to perfect a premium list and make rules to govern it. I would say \$500 for the best long keeping variety, as hardy as Duchess or Siberians, of good quality, fine appearance, medium to large in size, to keep until May; \$400 for second best, same rules to govern; \$300 for the third best; \$200 for best winter sweet apples; \$100 for a grape as hardy as the Concord, as good or better in appearance and quality, two weeks earlier and that will keep well into winter. If any or all of these were now originated, it would require five more years to give them the requisite tests and probably \$200 per year would meet the demand."

The Committee on President's address, consisting of Messrs. S. M. Emery, J. H. Stevens and F. C. Gould, subsequently submitted a report which was adopted, in which they recommended action with regard to the creation of a fund for payment of premiums, as follows: (See page 112, Report 1882.)

"Second. That the Executive Committee be instructed to appropriate the sum of (\$200) two hundred dollars, to be set aside annually from the annual appropriation of \$1,000, and invested in interest bearing bonds, interest and principal to be devoted to a premium list, with the object in view of increasing our list of hardy winter varieties of apples, under such restrictions as shall be deemed best by the Society."

The Secretary, in his annual report for that year, remarks:

"With its customary liberality in forwarding projects of public weal, our last regular session of the Legislature granted us an annual appropriation of \$1,000 to aid us in our work, and also increased the number of our reports to be printed by the State and also allowed us an increased number of pages."

Mr. J. T. Grimes, present Treasurer of the Society, at the conclusion of an article on "the cultivation and protection of orchards in Minnesota," says: (See page 121, Report 1882.)

"The State has given us a liberal annual appropriation to aid us in our investigations and experiments and will certainly look to us for its legitimate results."

By reference to the annual report of the Society for 1886, the condition of the reserve fund will be seen at a glance. (See report of Treasurer Grimes, page 219, Report 1885.) It is given as follows :

RESERVE FUND.

Jan. 15, 1881	Accrued Principal.....	\$600 00
Jan. 15,	Accrued Interest.....	43 78
Jan. 20, 1885.	Interest for the Current Year.....	38 62
Jan. 20.	Reserved Principal for 1884	200 00
Reserved Fund Total.....		\$882 40

After giving a statement in detail of receipts and disbursements for the current year the amount of the balance in the treasury is given as the sum of \$257.86. Under the head of remarks the Treasurer says: I would respectfully call your attention to the fact that the finances of the Society are insufficient to meet the expenses and maintain the reserve fund which was placed by order of the Society as a special premium fund to encourage the originating and dissemination of new varieties of apples specially suited to supply the demands and wants of the orchardists of this State."

In the opinion of the Executive Committee the setting aside of a certain amount annually to be used for payment of premiums is in accord with the letter and spirit of the act granting aid to the society as "necessary and proper." The most rigid economy has been observed in order that this fund might be secured for the purpose set apart to be used.

Respectfully,

S. D. HILLMAN, Secretary.

ATTORNEY GENERAL'S OFFICE,

ST. PAUL, Nov. 3, 1885.

S. D. Hillman Esq., Secy. State Horticultural Society.

Dear Sir:—Your communication has been duly considered. It appears that the legislature in 1881 made an annual appropriation to your Society in the words following :

SEC. 3. "That the sum of one thousand dollars (1,000) be annually appropriated, out of any moneys not otherwise appropriated to aid the said Horticultural Society in the work of distributing their reports, collecting data, specimens pertaining to horticulture, providing a suitable place for its books, specimens and articles of the Society, for payment of salary and expenses of its secretary and committees for labor actually performed by them, and other uses that may, in the opinion of the board of directors, be deemed necessary and proper. The said sum shall be paid by the State Treasurer on the order of the President of the said Horticultural Society." (Sec. 3, ch. 72, G. L. 1881.)

That your Society has heretofore annually drawn the entire \$1,000, but has set apart a portion of the money so appropriated to create a "Reserve Fund" which with accrued interest on January 20, 1885, amounted to the total of \$882 40. That this reserve fund was created under a resolution of your society passed at its meeting in January 1882, which is as follows :

Second. "That the executive committee be instructed to appropriate the sum of (\$200) two hundred dollars, to be set aside annually from the annual appropriation of \$1,000 and invested in interest bearing bonds, interest and principal to be devoted to a premium list, with the object in view of increasing our list of hardy winter varieties of apples, under such restrictions as shall be deemed best by the Society.

You say that "In the opinion of the executive committee the setting aside of a certain amount annually to be used for the payment of premiums is in accord with the letter and spirit of the act granting aid to the Society as "necessary and proper." The most rigid economy has been observed in order that this fund might be secured for the purpose set apart to be used."

And my opinion is asked in regard to the action of the State Auditor in withholding orders upon the State Treasurer, for any portion of the annual appropriation while the "reserve fund remains unused, he claiming as I understand it, that the annual appropriation is for current expenses and that the Society has no right to draw and accumulate any portion of this annual appropriation for any purpose.

The State Auditor, in my opinion is right in his holding. Appropriations of public funds must be strictly construed. The constitution declares that "no money shall ever be paid out of the treasury of this State except in pursuance of an appropriation by law." In the case of the People vs. Burns, 27 Barb. 93, the Court in construing a similar provision of the constitution of New York, say, "It is in-

tended as an absolute and compulsory restriction upon every disbursement from the treasury, except under the sanction of a legislative appropriation *specifying distinctly the object to which it is to be applied*, thus imposing a salutary and needed check upon the disbursement of the public funds."

Now the question is, what is the object to which the money appropriated by the law under consideration, was intended, by the legislature, to be applied.

1st. It is an annual appropriation and if not all drawn or used during any one year, the balance would not be available in any subsequent year. Opinion of Judge Cornell, p. 260 Opinions Atty's General.

2nd. A number of specific objects are enumerated, all of which are in the nature of current expenses viz.: distribution of annual reports, collecting data, procuring a place for books, &c. (rent) payment of the salary and expenses of secretary and committees, &c. Then follows the provision under which the Society claims the right to set aside a part of the money to create a fund to pay premiums in the future, viz: "*and other uses that may in the opinion of the board of directors be deemed necessary and proper.*" Two familiar rules of construction are that "the expression of one is to the exclusion of all others," and "the enumeration of one class excludes all others not of a similar class." Hence the words "*and other uses*" must be held to mean "*other uses similar to those heretofore enumerated in the law*, that may be in the opinion of the board of directors be deemed necessary and proper."

In other words any other necessary and proper use that will annually, during any one year, "aid the Society in its work" The statute is an appropriation for current aid only and the funds cannot be allowed to accumulate and then be drawn, or be drawn and then accumulated for any purpose or object however praiseworthy.

Yours Truly,

WILLIAM J. HAHN, Attorney General.

The present financial condition of the Society as shown by the treasurer's report, is very satisfactory.

The following is a statement of receipts and disbursements by the Secretary from January 24, 1885, to January 18, 1886, as shown by itemized statement submitted:

Secretary's financial statement.

RECEIPTS.

Membership fees.....	\$51 00
Warrant on Treasurer.....	13 66
Balance due Secretary.....	35 55
Total.....	\$100 21

DISBURSEMENTS.

Stamps, envelopes and postal cards.....	\$46 38
Expressage, freight and drayage....	25 06
Printing	18 75
Delegates at hotel.....	5 00
Stationery.....	3 35
Railroad fare and telegram.....	7 67
Total.....	\$100 21

Respectfully Submitted,

S. D. HILLMAN, Sec'y.

The Annual Report of the Treasurer was then read:

TREASURER'S ANNUAL REPORT.

To the President and Secretary of the Minnesota State Horticultural Society.

Gentlemen:—I have the honor to submit the following report of the receipts and expenditures of the Society for the current year ending Jan. 20th, 1886.

RECEIPTS.

1885.		
Jan. 31.	Balance in treasury.....	\$257 86
31.	From membership fees.....	63 00
March 7.	M. Cutler, membership fee.....	1 00
June 24.	S. D. Hillman at summer meeting for membership fees.....	29 00
24.	G. H. Roberts, membership fee.....	1 00
27.	From State Treasurer of State appropriation....	250 00
27.	C. A. Smith, membership fee.....	1 00
Sept. 30.	From State Treasurer.....	150 00
Total receipts.....		<hr/> \$752 86

The following disbursements have been made as shown by the vouchers herewith returned.

BILLS AUDITED AND DIRECTED PAID AT THE WINTER MEETING.

1885.		
Jan. 22.	T. M. Smith, incidental and other expenses.....	\$10 00
22.	J. T. Grimes, for interest on funds advanced and incidentals..	9 02
22.	J. M. Underwood, railroad fare and expenses attending Executive Committee meeting.....	5 00
22.	A. W. Sias, expenses on Seedling Committee for 1884.....	10 00
22.	J. S. Harris, for like expenses for 1884.....	9 50
22.	J. S. Harris, expenses in attending the meeting of Executive Committee Jan. 15, 1885.....	10 80
22.	Mrs. Ida E. Tilson, expenses to State meeting on invitation of the Society, Jan. 1884.....	7 70
22.	Mrs. Ida E. Tilson, expenses on same account Jan. 1885.....	7 50
22.	The Daily Globe, printing.....	1 50
22.	Pollock & Co. for use of plates.....	2 00
22.	C. L. Smith, services as assistant secretary, etc.....	15 75
22.	S. D. Hillman, Stenographer.....	20 00
22.	E. H. Cayner, membership fee returned, (being twice paid)...	1 00

DISBURSEMENTS.

1885.

Jan.	22.	Premiums paid at winter meeting, 1885—	
		On fruits.....	\$48 00
		On vegetables and seeds.....	12 25
Feb.	13.	G. W. Fuller, expenses as delegate to Iowa.....	33 87
May	27.	S. D. Hillman, salary first quarter.....	100 00
June	24.	Oliver Gibbs, Jr., balance due on settlement.....	43 33
	24.	Wyman Elliot, express charges	1 55
	24.	J. S. Harris, expenses as delegate to Wisconsin.....	8 85
	25.	Premiums paid at the summer meeting—	
		On fruits.....	56 00
		On flowers.....	17 00
		On vegetables.....	21 00
	25.	S. D. Hillman, as per account rendered.....	42 66
July	17.	H. L. Smith, printing	16 00
	17.	Pioneer Press Co., printing.....	15 00
	17.	S. D. Hillman, salary second quarter... ..	100 00
Oct.	1.	S. D. Hillman, salary third quarter.....	100 00

1886.

Jan.	20.	T. M. Smith, balance on account.....	\$3 50
	20.	S. D. Hillman, freight on books.....	2 23
	20.	Pioneer Press Co., printing circulars summer meeting....	15 00
	20.	C. A. Merrill, on account of summer meeting.....	5 00
	20.	J. T. Grimes, incidentals for 1884.....	4 76
	20.	J. S. Harris, services on executive committee and expenses....	10 00
	20.	C. L. Smith, assistant secretary at the winter meeting 1886....	15 00
	20.	Rent of hall for winter meeting and janitor's services.....	23 00
	20.	T. M. Smith, salary as President 1885.....	25 00
	20.	S. D. Hillman, salary fourth quarter.....	100 00
	20.	Treasurer's salary 1885.....	25 00
	20.	E. H. Cuzner salary as librarian 1885.....	10 00

Total expenditures..... \$943 85.

Receipts for the current year..... \$752 86.

Overdrawn..... 190 99.

\$943 85

The report of the Treasurer was on motion accepted, and with the financial report of the Secretary referred to the Executive Committee.

FINANCE COMMITTEE'S REPORT.

To the President and Members of the State Horticultural Society:

We, the members of the Finance Committee beg leave to report that we have examined and audited all bills as presented, and have

examined the books, vouchers, and annual report of the Treasurer and find them all correct.

J. S. HARRIS, Chairman.

WYMAN ELLIOT,

M. PEARCE.

Following is the report of the Librarian :

LIBRARIAN'S REPORT.

Total number of reports of Transactions of the Minnesota State Horticultural Society now on hand: 1866-73, (combined) cloth, 210; 1874, paper, 375; 1875, paper, 220; 1876, paper, 1,020; 1877, paper, 340, cloth, 10; 1878, paper, 140, cloth, 30; 1879, paper, 9, cloth, 10; 1880, cloth, 102; 1881, paper, 1,210, cloth, 250; 1882, paper, 1,680, cloth, 600; 1883, paper, 143, cloth, 1,005; 1884, cloth, (about) 300; 1885, paper... , cloth 75.

BOOKS RECEIVED.

Among the volumes received during the past year are the following :

5	Copies Wisconsin Horticultural Reports,	-	-	-	1883
6	" " " "	-	-	-	1884
50	" " " "	-	-	-	1885
25	" Dakota, " "	-	-	-	1885
6	" Illinois, " "	-	-	-	1884
6	" Michigan, " "	-	-	-	1882-4
6	" Kansas, " "	-	-	-	1884
50	" Montreal, " "	-	-	-	1884
10	" Missouri, " "	-	-	-	1884
25	" Iowa, " "	-	-	-	1884
6	" Indiana, " "	-	-	-	1884
5	" Colorado, " "	-	-	-	1885
5	" Nebraska, " "	-	-	-	1884

About five hundred copies of our reports have been sent out during the year by the librarian.

E. A. CUZNER,

Librarian.

REPORT OF COMMITTEE ON NOMENCLATURE.

Your committee heartily approve the efforts being made by the American Pomological Society, and other societies looking to the

shortening of the names of fruits. This is a matter of national importance—a scheme in fact in which all nations are interested; and were it possible for a committee from all nations to meet at Boston during the next session of the American Pomological Society at that place and bring about this much needed reform—it would, as P. Barry remarked “be the crowning work of the American Pomological Society.

A. W. SIAS.

WYMAN ELLIOT.

DISCUSSION.

Mr. Grimes. Under the ruling of the Attorney General, as I understand it, we cannot draw any money from the State Treasury until after we have expended it. You will notice, gentlemen, in my report that I have not included the funds we had on hand for paying premiums, which is \$842. 68. We cannot hold that for any purpose as a permanent fund, and I would recommend to this Society that we change that fund and make it a contingent fund. If we cannot draw anything ahead, when your bills are all in, you will have nothing with which to pay them. Disbursements are made the first day of February and the first day of August in each year. We can draw the funds to which we are entitled to close up all outstanding bills. But your summer meeting is coming on; your Secretary, in the mean time, will be entitled to \$200, and you will need funds on hand to meet expenses. I don't think we ought to allow our Society to run into debt and be borrowers upon some one's generosity. Now, we can hold that fund, I think, under the law, but we will have to hold it as a contingent fund; we can borrow from it from time to time, always replacing it when we receive our appropriation. As a contingent fund there will be no question as to our right to hold it.

Mr. Smith. In regard to experiment stations referred to in the report of the Secretary, I think that is one thing that should be discussed, when the time arrives.

Mr. Harris. I think the Secretary has discussed that pretty well; I regard it as the best Secretary's report I ever heard.

Mr. Smith. There are some things that I think call for a little discussion on some of the matters suggested in this report. Reference is made to the experiments going on. I think this Society ought to take some action by which the information brought out in these experiments can be obtained by the people of the State. Our active membership is

only about 200; our reports are limited in their circulation and we ought to manage in some way to place the information brought out in these meetings and these experiments into the hands of more of the people of the State. The organization of local societies is a work that has been materially neglected, and I think we ought, as a Society, and that our Executive Committee ought to do more in regard to the organization of these local societies and getting reports from them; and when a society is organized we ought to assist in keeping up that organization. We have heretofore set aside \$200 a year as a reserve fund; we find that under the law we can not do that. I suggest that we do as the Michigan society did; they issued a fifty-page "Primer of Horticulture"; they had ten thousand copies struck off, and put into general circulation throughout the State. That "Primer of Horticulture" was made up of articles on the subject of fruit from some of the most practical men that could be found, by some of the best men of that society, and it has done a grand work in that state. I will offer the following resolution: That it is the sense of this Society that any balance of funds over and above current expenses be expended in the work of organizing local societies and the distribution of horticultural literature, under the direction of the Executive Committee.

President Smith. That would provide for spending all the money.

Mr. Smith. I only wish to include what we have held as a reserve fund. I would sooner take the chances of using that \$200 in the way I have suggested, than any other, and then if necessary, go to the legislature and ask them to pay it. I think that \$200 expended in work of that kind throughout the State would increase the interest in horticulture generally and greatly increase our influence, as a Society.

Mr. Grimes. I am afraid your opinion would be very liable to mistake.

Mr. Smith. Our appropriation is small. We want a membership outside the ranks of our two hundred members; we want to get two thousand or ten thousand men, if possible, in the State interested in horticulture, and to do that we must place horticultural literature in the hands of more people.

Mr. Harris. I don't see any necessity whatever for the project proposed. I think we are expending our funds where they will tell to the best advantage of the Society. I do not see the necessity of making it compulsory with our Executive Committee to publish a Primer of

Horticulture. Our proceedings go out in the newspapers; they will publish them every year, and won't charge one cent for doing it. There are perhaps twenty-five thousand families that our proceedings will reach by this means, and by subscriptions the number may be largely increased.

Mr. Pearce. I think there is more general information gathered from the press than from any other source. Local societies should be established over the State, with good live members, their transactions and proceedings published in the local papers would attract public attention and interest; and in connection with that, a few good lecturers, posted on the subjects on which they speak, would do more to disseminate a knowledge of horticulture and educate the people in the growing of the various fruits than all the books that are published. Books might be piled up here to be sent free on application, and there wouldn't one man out of a hundred ever call for them. It is only those specially interested that would call for these publications. But if a public lecture is given in a town, with proper billed notice given, and a hall procured, the house would be filled and in all probability right there a local society would be established. We want to spend a little money in the way of lecturing; I don't believe it could be spent in any better way.

President Smith. I would call the Society to order. Mr. Smith's resolution has not met with a second; it is not properly before the Society.

Mr. Pearce. I will second the motion merely to get it before the house.

Mr. Cutler took the chair, and President Smith moved as an amendment to the motion that the unexpended balance now in the treasury be placed as a contingent fund in the hands of the Treasurer.

The motion was seconded.

Mr. Underwood. It seems to me that the latter motion utterly destroys the former. I don't think it would be proper to pass upon a resolution that completely wipes out the resolution under consideration.

Col. Stevens. Do I understand the original mover accepts the amendment to the resolution?

Mr. Smith. No, I don't see any relevancy.

President Smith. From the reading of the resolution, as it was originally put, it would leave our treasury destitute. It is bad policy to get in debt. And we cannot possibly foretell what expenses six

months ahead are going to be incurred. I have been a member of this Society for a good many years, and a good many others here will join me in the assertion that we many times have had to "put our hands in our pockets" to accomplish anything; our funds were not sufficient. It has been one constant effort of the Society to get out of debt. If we have any unexpended balance, as I understand, in the treasury, they are willing under the rulings of the Attorney General, to pass it to our credit, and we can keep it until we can see intelligently what use we may desire to make of it for the best advantage of the Society, and that will redound to the best good of the people of Minnesota.

Mr. Harris. I don't see any necessity for it, and I am opposed to binding the Executive Committee as Mr. Smith's resolution would bind them. I don't want it to be hampered by any such resolution, and it is unnecessary.

Col. Stevens. If I understand it the original resolution is not before the house at all.

The Chairman. I think it is.

President Smith. I will withdraw my motion for the sake of letting the original motion come before the Society.

Col. Stevens. Vote on the amendment, and then if the amendment is carried, vote on the resolution as amended; that is the parliamentary rule. All this discussion is out of order.

The Chairman. I shall have to decide that the original motion is before the house, as the amendment offered was entirely distinct from the resolution.

Col. Stevens. That don't make a bit of difference; the resolution and the amendment may be as far apart as the heavens and the earth.

Mr. Underwood. I can't agree with Col. Stevens; you might make a motion to build a flour mill; it wouldn't have anything to do with this motion at all. I am certain that the chairman should rule the amendment out of order.

Col. Stevens. I have been a member of both houses of the legislature, and I have seen a member bring in a resolution and an amendment would be offered to it which was entirely foreign to the subject of that resolution, and I have seen it passed.

The Chairman. I will call for the reading of the resolution, and if there are no further remarks I will put the motion.

The resolution was again read.

President Smith. I think under the law that would be out of order;

if you read the law, you will see that it leaves it with the board of directors to spend the funds of the Society for certain purposes, and I don't think we have a right to spend it for this purpose.

Mr. Smith. The resolution does not make it absolutely binding upon the Executive Committee; but it recommends that such unexpended balance as there may be over and above current expenses should be used in the manner indicated.

Mr. Grimes. I should regret exceedingly to have this pass. You have a capable Executive Committee, why not leave it discretionary with them, and not make it binding upon them to spend every dollar of the appropriation on hand in a certain way. I think it would look a little bad on the face of it.

Mr. Sias. I take the same ground as Mr. Grimes. It would look as if we were trying to spend our funds in order that we might immediately draw the balance from the treasury. I don't think it would look exactly right.

The motion was then put, and was lost.

President Smith. I now offer the resolution that the unexpended balance in the treasury be placed in the hands of the treasurer as a contingent fund, to be drawn upon as needed.

The motion was adopted.

The following paper was then read:

GRAPE GROWING IN MINNESOTA.

By SAMUEL T. DOUGHTY, Lake City.

At the request of your Secretary I will endeavor to state the method I pursue in growing grapes in Minnesota.

Born and raised on Long Island I was accustomed to seeing fruit, and it was to be had without the trouble of my growing it.

I came to the Lake Pepin Valley in 1855, when white men were scarcer in that locality than now. My life was that of a frontiersman and I had little time or opportunity to do else than to provide the necessities of life.

In 1865 I began to investigate the subject of grape culture, depending on books for my information. It all seemed very easy and plausible as there shown with nice cuts. But some way or other I did not get the fruit in quantities to suit me, so I began to investigate for myself the habits of the vine and its fruiting.

The books told me to cut to the third joint, or the system known as

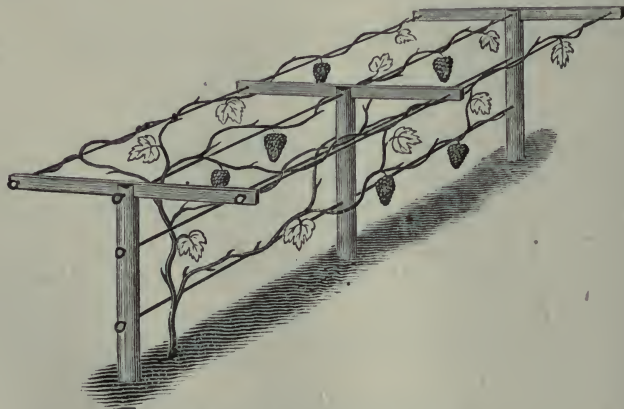
close pruning; which does well enough for the nurseryman who wants grape wood to set; but I soon satisfied myself that success in the object I sought demanded and depended upon an abundance of fruit-bearing wood.

As a boy, at the risk of my life oftentimes, I had ventured out on the limbs of trees to reach the best clusters which I invariably found at the ends of the vines.

Dame Nature usually knows her business and here was a suggestion that I commenced to act upon and, instead of cutting to the third joint, I from year to year increased the length of my bearing canes until they were from six to ten feet long, depending on the vigor of the root and the ripeness, or mature condition of the wood.

I will briefly narrate the manner of operation commencing from the ground.

Two-year old vines are the most desirable. The ground should be in good condition and I would plant in rows running north and south twelve feet apart; the vines should be set on ridges eighteen inches to two feet high and ten feet apart on the ridges. For a trellis I use posts out of the ground five feet with a two by four scantling at right angles with the row, four feet long. I string two wires on the upright posts and on the cross scantling three wires, one in the center and one at each end.



Grape Trellis, with wire attached.

I grow mainly Concords and am not troubled with mildew or any disease. I manure the ground liberally by mulching with well rotted manure, drawing the fibrous roots to the surface where they get abundance of moisture. As rapidly as possible I draw the bearing canes onto the top cross-piece, pruning the leaves off partly below

the cross-trellis and allowing a free circulation on the upright posts so that the fruit as it comes to maturity will have ample access to all the air and sunlight that can be had.

The wires are so arranged that they can be drawn off the trellis in the following manner: The wires run the full length through augur holes in the tops of the posts. They are coupled in lengths of one rod each; by unhooking the coupling they can easily be drawn out, allowing the vines to drop to the ground where they are then covered with straw and earth as they lie on the ground between the rows; the snow collects on the straw and they winter perfectly.

When the vines get too large to handle easily I lay them on the ground and cover them for a new root; thus layering them, the result is a strong rapid growth of new wood. In trimming I never allow any old or stubborn wood to remain; but manage to have young sprouts coming on all the time, and when the old vines are not needed for layering I cut them off in the fall, always retaining enough wood to fully cover the trellis; in fact I make the root carry about all the wood I can get that is young, sound and thrifty, merely cutting back the terminal limbs and thinning them out.

I have this year on a single hill grown 216 pounds of grapes by actual weight. And I am confident that this vine will in the coming season produce 500 pounds of grapes.

I am also growing two varieties of California grapes, also the Janesville, the Prentiss and the Brighton, and all are doing well under the method above described.

Early frosts last spring caught fully one-third of the crop after the grapes had set, but with my plan as above explained the vines were up to the sun and moisture and the direct result was a second crop of bloom in ample time to ripen; all of which I attribute to the high, shallow, surface culture.

The following paper was then read by Mr. Latham:

GRAPE GROWING AT MINNETONKA.

By A. W. LATHAM, Excelsior.

To the fruit grower who has interested himself in this direction, the culture of the vine in this vigorous climate has been for many years an assured and certain success. But it is only of late that this is becoming generally known, and an interest awakened in this direction.

The recent devastation of our orchards of hardy trees, from which so much was hoped, is a prominent cause of the present general interest developing on this subject. While the Wealthy and Duchess and other iron-clad trees and plants have succumbed to the fierce, cold winds of January, the vine, snugly tucked away in its winter bed, has come forth year after year, bearing its annual and certain crop of most luscious and wholesome fruit. And while the severity of our winters have forced us to lay them under half a foot of earth and a coverlid of mulch, this extra care required has in itself been the means of our producing the largest berries and the handsomest and most perfect bunches known in the culture of American vines.

The vine grower in this climate has a large list to draw from, limited almost solely by the time of the first severe frost in the locality where he intends to plant.

The very earliest ripening grapes, like Moore's Early, Lady, and Early Victor, can be grown with a reasonable assurance of success in nearly every garden in the State, while the varieties of equal or greater value can be planted in more favorable localities; and in very favorable locations, where the soil is a clay loam with much fine limestone, elevations high and sheltered, well protected on the north and west by large bodies of water, varieties ripening as late as the 1st of October can be grown year after year with success. Even the late ripening Catawba can be perfected to such a degree as to snatch the laurels in competition with that variety grown in its native home.

In many localities in our State the vine is being cultivated successfully, and the planter may confidently expect to harvest year after year fine crops of fruit.

Of the locations especially favorable which I have visited, or with which I am well acquainted by report, there is none that surpasses the high, rolling and well timbered land on the south and east shores of our beautiful Lake Minnetonka. The culture of the vine here is rapidly becoming an industry, and it will soon be difficult to get out of sight of a vineyard along six or eight miles of this shore. The north and west shores and the islands and point of this lake also have vineyards which are doing well.

The number of bearing vines about Lake Minnetonka has been largely over-estimated, and I do not believe the number of full bearing vines to exceed 10,000, while, including the unusually large plantings of last spring, the whole number of vines now planted may be in the neighborhood of 30,000. The crop the past year from these vines was, doubtless, not to exceed 50,000 pounds.

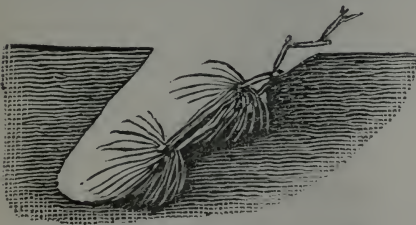
It is not my intention in this article to give full directions for planting and caring for the vine, for the benefit of the planter who is going into it as a business, as he will of course provide himself with some of the many good works on the subject, and become thoroughly posted; but if by a few plain directions I could induce every householder in the State to plant a dozen vines, and, with the little care necessary raise what grapes his family would use, instead of wasting his money on pear trees from Alaska and cherries from Lapland, at \$2.50 apiece, my trouble would be well repaid.

And now, first, before planting the vines he must get them. In locations liable to early frost, the planting must be limited to two or three very early ripening sorts, as Moore's Early, a hardy black grape of excellent quality, and the Lady, a greenish white grape, very rich and sweet; or, if not so particular about quality, the Janesville, a very hardy black variety, sure to bear a good crop of rather poor quality of fruit. If the location is reasonably exempt from early frosts, the list may be extended by the addition of the Worden, Cottage, Delaware, Brighton, and some of the Rogers. These are all excellent varieties, with which the public are generally familiar.

The standard variety of the country, the Concord is somewhat later in ripening than those named, and should not be planted largely, except in places so well protected from frost as to be safely adapted to the culture of the grape on a large scale for market.

In my different vineyards I have tried setting vines at distances apart varying from six to ten feet. My conclusion is that the rows at eight feet apart afford sufficient room for sunlight and air, and for winter covering the vines. In the row, seven or eight feet is sufficient.

Before planting, if the vines come to you with roots two or three feet long as is often the case from Eastern nurseries, they can as well, be cut off to a length of three or four inches, with equally good results and much labor saved in planting. Also trim the top of the vine to one straight cane, cutting away all the branches



save them from winter-killing.

Dig a slanting hole wide enough to take in these shortened roots without bending. In planting place the vine deep enough to bring the crown five or six inches below the surface, which will get the main roots under ground, and

The vine as planted should slant in the direction in which it is intended to be trained upon the trellis. This direction will depend upon the prevailing winds. For instance, if the trellis is built running east and west, and the prevailing winds in summer are from the west the vine should slant towards the east and be trained in that direction on the trellis. This is an important point in keeping the vine well spread upon the trellis.



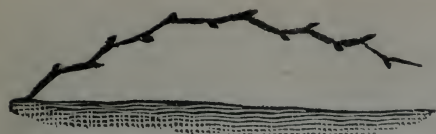
I am unable to see a difference in the success of my vines depending upon the direction of the rows. The rows may run toward any point of the compass convenient, only be careful to lay them out horizontally around the hillside to prevent the ground from washing. Some south slope for a location is undoubtedly better, as hastening a little the time of ripening, but the grape will do well on any slope, even a north slope, and the matter of protecting the growing vine is of far greater importance generally than the question of slope.

The newly planted vine should be well cultivated, and permitted to grow the first season without restraint, and in the fall pruned by cutting off all branches and side shoots, and cutting the cane back to within a foot of the ground.



The vine should be buried for winter by pressing the cane to the ground and covering it with four or five inches of soil, and later on, before cold weather sets in, applying for protection, a mulch of two or three inches depth of straw or other suitable material. This winter mulch is absolutely necessary to insure the safe keeping of newly planted vines, and should be repeated for several winters at least. The following spring a stake six feet long should be set close to each vine. Permit only one bud to grow, and that the strongest which starts, getting rid of the other shoots by rubbing them off while small. Tie this growing cane to the stake as it grows, and if it is making a very vigorous growth it will be well to pinch off the end when it reaches the top of the stake. The laterals, which are the little branches that start out along the sides of the growing cane, should also be pinched at their ends when they have pushed out the second leaf.

Thus, the second fall's pruning will consist in cutting off all the laterals up to the cane, and in pruning this cane leave about two-thirds of the growth it has made this year, not to exceed four feet.



The vine may now be buried as directed for the previous year, and it will be found convenient to take out a little earth close to

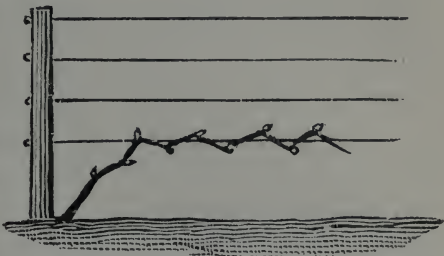
the vine on the side where it is to be bent.

As the vine gets older and stiffer, in laying it down for winter it will be found to bend easier and more safely below the ground, which the removal of this earth will permit.

The following, or third spring the trellis should be built on which the vine is to be trained.

In my experience I have found posts set twelve feet apart, sufficiently near to sustain the weight of the mature vine. If the rows

do not exceed 125 feet the posts will need no bracing. Use four wires, No. 12 galvanized iron, the lowest one about 10 inches from the ground, and those above about 10 inches apart. They should be fastened with staples driven in so as to allow the wires free play. The wire should be fastened securely about one of the end posts, passing through the other end post, and drawn snug every spring by the use of small rollers and pins. Along the lower wire of this trellis the vine is to be tied.



If the vine has wintered well, two shoots will grow from nearly every bud. These should be thinned out when they have made a growth of two or three inches, leaving the strongest shoots at a distance of about ten inches apart. These shoots must be tied to the wires as they grow, and pinched off at the end when they have reached the top wire. This pinching will check the growth a little, and should be repeated when they commence to grow again, and so on, leaving one new leaf to grow at each pinching. The laterals, heretofore described, should be pinched off just beyond the first leaf, and when they start to grow again pinch a second time leaving another leaf, and so on during the growing season. If the vine is thrifty it will bear this year several pounds of fruit. As soon as convenient after gather-

ing the fruit the vine may be pruned and prepared for burial, not necessarily waiting for a frost to kill the leaves as it will do no harm to bury even with some of the leaves on the vine. In pruning, this, the third fall, first select a cane near the extremity of the vine which was tied last spring to the lower wire, and cut it off at a length sufficient to reach the next vine on the trellis. This cane must be tied to the lower wire next spring, and will complete the permanent vine. The laterals should be cut off from this cane; the remaining canes must be cut back, leaving only the two lower buds, and any laterals on these spurs must be removed. In pruning do not cut within an inch of the bud, to avoid its winter killing. Bury as directed.

The next spring, the fourth, tie to the lower wire as directed, and permit one or two canes—and no more—to grow from each of these spurs, saving always one cane from as near the base of the spur as possible.—In pruning hereafter you must leave the cane last described, cutting it off at two buds, and then cutting off the old spur just above where the new spur starts. The new cane laid down to extend the vine this year should be treated the same as directed for the vine last year. When pruned in this, the fourth fall, the vine will consist of a main arm extending along the lower wire of the trellis to the next vine, with spurs of two buds each standing some ten inches apart.

The subsequent summer's treatment will be a repetition of the treatment suggested for the spurs last summer, and each fall's pruning will leave the vine about as described. If the summer pinching is followed up persistently as directed, the two buds at the base of the canes which are to be left, in this system of pruning, will generally be well developed fruit buds, and will bear a good crop, but carelessness in permitting a long, unchecked growth of the canes or laterals will result in locating the fruit buds higher up, and fall pruning will leave little or nothing that will bear fruit another year.

If it were convenient to leave long canes for next year's fruiting, as is often done in localities where it is not necessary to bury, a more slipshod treatment would answer; but to keep the vine in good shape to bury, it must be pruned to short spurs, and to perfect these spur buds for fruit requires persistent checking of the growth during the growing season.

It is a good plan before burying the vine to remove the earth to a depth of three or four inches close to the vine and cut away any roots which have started that near the surface of the ground. It would be well to repeat this every other fall.

Do not be afraid of giving these vines good care. They will amply repay you for your extra trouble. Use a one-horse plow spring and fall, and cultivate and hoe repeatedly during the summer.

There is only one way of raising good crops of fine grapes, and when you have learned to practice that, you have the key of success to any branch of business or avocation in life. Do it most thoroughly. Plant only as many vines as you can look after aright. A dozen vines properly treated, will bring you more profit than a hundred neglected ones, and perfection in this little matter may show you the road to success in greater things.

DISCUSSION.

A Member. Do you plow early in the spring?

Mr. Latham. I do plow early in the spring, and I plow late in the fall. The first thing I do in the vineyard in the spring is to plow, and the first thing I do after getting the vines up is to plow—not deep enough to break the roots. I suppose the plow does cut some roots, but no harm is done plowing twice a year, if I don't plow deeper than three or four inches. I do not think the vines are injured by taking off a few roots. By taking off a large number it might injure them. I pinch off the end of the vines; I do not remove the leaves. You will have to pinch off a foot of the vine some times; I just pinch off the ends for the purpose of checking the growth.

Mr. Pearce. Last fall, during our State fair, Mr. J. B. Rogers, of New Jersey, was here, and I took a great deal of interest in what he said in regard to trimming, and in regard to fruit growing generally. First he condemned late cultivation and deep plowing. He would let the work in the spring be thorough but in the latter part of the season he condemned deep plowing and cultivation. He favored very shallow plowing, just surface work, before the grapes ripened. After the season of ripening commenced, he said we ought to stop cultivation entirely. I was with him probably ten or twelve days altogether. Again, he was very particular about the trimming, that is by pinching back. He did not allow the vines to run over a certain length; I think about four feet was the height preferred; anything over that was equivalent to a certain amount of weeds. In speaking of pinching back he said the laterals were the parts on which the finest fruit could be grown; those must be watched very carefully. By pinching you check the forward growth, throw the sap down into the fruit-buds and develop those. He said the whole process was in the hands of the

trainer, and the proper thing to do was to seek to throw the strength of the vines in the fruit buds and develop the fruit.

Mr. Pearce here exhibited some vines to illustrate what he had said, to show the different kinds of buds, etc. Buds are divided into four classes: fruit buds, wood buds, forcing and foliage buds. A fruit-bud is a perfect bud; it is perfectly round at the base, and a little above it bulges out in the shape of a hay-stack. The forcing bud is inclined to be flat, but little inclined to be peaked. The wood bud is a long, peaked, sharp bud; there is the distinction. Now, in pinching your vines back, let the laterals remain, don't destroy them, if you do, you destroy the fruit buds. You want to develop the fruit buds. That is what you need for the next year.

Mr. Kellogg. Does he claim there are no fruit buds on the main cane?

Mr. Pearce. Oh, no; but we pinch the laterals you know to establish fruit buds on the cane, although we often see them on the laterals. In trimming our vineyard this season the laterals were entirely destroyed.

Mr. Harris. Mr. President, I think there should be no cultivation in the vineyard after about the 10th of August. All pinching should be suspended as early in the season as that. Any pinching later than that I find is injurious. Any great amount of foliage that you remove after the growth has commenced is damaging, because it weakens the vitality of the vines, and therefore all pruning should be done in the pinching back of the vines, and that too as soon as the bunch is well formed. When the ends of the vine are pinched back, the sap immediately goes to forming the buds below, and developing the fruit buds that are necessary. Unless the laterals and sprouts from the bottom are allowed to grow too much, the vine will produce just about so many fruit buds. One of the greatest objects of pinching back is to have those fruit buds down at the base of the vine where you can control them, instead of out in the trellis. Any man will notice, that has had experience, that the finest bunches are on the lowest bar of the trellis.

Mr. Sias. I don't wish to discuss this matter. I have thought there might be some new beginners that might possibly be discouraged, or confused by hearing so much about different buds and pinching, and all that sort of thing. It seems there is a wide range between these two papers. I would say, in the first place, these two parties that wrote these papers are among the most successful grape growers in

the State. One of them, it appears, constantly pinches back his vines, while the other trains them very high. By the latter system it seems he has had wonderful success, but he does not tell us anything about pinching, and the idea occurred to me right here (and it may be an encouragement to new beginners) that after all that has been said there is possibly more in the style of the man than there is in the style of the pruning.

Mr. Tuttle. I think the vine requires different treatment on different soils. Different varieties of grapes require different treatment. Now, this first paper advanced the idea that we must have a considerable amount of canes. That depends upon the variety of grape. I have never been able to raise grapes on rich soil without long canes. With the Concord on rich soil it requires a good deal of vine. You can pinch back and cut back closely while the vine is young, but the Concord needs more vine in a rich soil than others. There is a gentleman in my neighborhood who has two Concord vines that have been growing for a number of years. He has grown from six to nine hundred pounds of fruit on those two vines. He gives them abundance of cane, and the crop is as regular as the year comes around. If you put the Concord on heavy clay, which is the best soil you can put it in, it don't need so much top cane as it does on the rich prairie soil. We practice pinching off before blossoming; I find it increases the weight of the cluster to nearly double. Since we have practiced that we have had no trouble in getting very large clusters of grapes, and an abundance of them.

A man in our place had a Rogers vine, and a cow bit off the end of it. That vine produced wonderful clusters; he went on and treated his vineyard in that way, and I never saw such clusters for fruit. I can go in there and get a bushel of grapes of the heaviest clusters as large as we ever exhibited at our State fair. I commenced the same practice (but I don't use a Jersey cow) and I have had a very good proportion of large clusters ever since. I pinch off the ends of the vine just before blossoming. I am very confident that practice will increase the quantity of fruit, and it will certainly add to the size of the bunches.

Mr. Kellogg. I have listened with interest to these two admirable papers that are more particularly designed for professional growers, noted the different modes of treatment of the soil, and the different methods of cultivation; one mulches and the other plows deep. One of them, perhaps both, practices summer pinching and summer prun-

ing. Now, to a new beginner in planting, with the discussion we have here, it seems to me it will tend to a confusion that will discourage almost anyone. The papers are admirable, but there is a marked difference in the treatment by the two men who have both been so successful.

Mr. Smith. Mr. Doughty has a sandy soil, and Mr. Latham's is a clay soil.

Mr. Kellogg. That will explain the different modes of soil treatment. One of the most successful orchardists in my county has a good many vines. He said he had more consolation and more pride in the fact that he had never pruned than anything else he did. The Janesville was recommended in one of the papers, but to my thinking the Janesville is good for everything but to eat. It is certainly a poor quality of grape, but productive enough. It will bear good and bad treatment. Now, I would say to those farmers that want to raise a few grapes for their own use, not to be scared to death by these professionals that pinch and prune all summer. Set out your vines, put them down in the fall, and take them up in the spring, gather in their season, and get your fruit.

Mr. Latham. I want to say a few more words before this discussion is closed. Of course, I did not undertake to cover the whole ground. I think the cultivation of the vine is pretty generally understood by the practical members of this Horticultural Society. Mr. Doughty mulched his soil instead of cultivating. That is a very good idea; there can be no objection to mulching for a dozen or two vines, but if you commence to mulch, you will have to keep it up; you can't leave it off. You can make up your mind to that, because it brings the roots to the surface, and if you leave off mulching and there is no snow on the ground, the roots will winter-kill. My object in plowing in the fall, was not to cultivate at all, to get layers with three or four inches of soil over these.

There are two ways to train the vine. If you choose to let your vine grow in a loose manner it will grow along the fence, but in order to get fruit you have got to leave the wood; that is all there is about it. You have got to have a long vine with a great many branches, and save the wood; if you don't, you won't have any fruit. If you want to raise a few vines and get them in a neat, compact shape, then summer pinching is necessary. When the growth gets to be what you want it, one, two, or three feet, stop it right there. I very nearly killed my stock of Delawares once, by following Fuller's directions.

I thought Fuller knew everything in those days and I didn't; I waited before pruning till the berry was the size of a currant; I was anxious to get the best results. I took off half the foliage; it made the vines look sick, some of them, and made me sick. I then began pinching, and discovered that I raised some pretty good fruit.

Mr. Underwood. Just a word in explanation of Mr. Doughty's plan of grape culture. He does not recommend anything; he simply tells what he has, and what he is working with; and he doesn't offer it as a professional plan for raising grapes or anything of the kind. He has simply told how he raises his grapes, at the solicitation of the Secretary of this association and myself. I know Mr. Doughty very well, and I know he will get more vines and more grapes from about forty vines than anybody else gets from—I was going to say a hundred vines. I know a man on the next block that makes grape growing a speciality, and I think Mr. Doughty had more grapes from a single vine than he had on his whole lot. I think a plan that brings forth such excellent results, whether it is a professional's plan or an amateur's, or whatever it is, ought to be known and brought out. I would like to see Mr. Doughty's plan illustrated with cuts. I have set out some vines and I am going to try it on his plan. He has mainly, as you see, the Concord variety.

Mr. Harris, on behalf of the committee on grapes, then read the report of the committee;

GRAPES RECOMMENDED.

Your committee appointed to present a list of grapes for general cultivation in Minnesota to be adopted by this Society do respectfully submit the following:

1st, Concord; 2nd, Worden; 3d, Moore's Early; 4th, Delaware; 5th, Lady; and for general trial Early Victor, Brighton, Oporto.

J. S. HARRIS,
W. E. BRIMHALL,
J. T. GRIMES,
TRUMAN M. SMITH,
O. E. SAUNDERS.

On motion of Mr. Pearce, the list as presented was adopted by a vote of thirty in favor, and none against.

The following paper was then read :

HUMBUGS IN HORTICULTURE.

By M. CUTLER, Sumter.

Our constitution says the object of this Society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other horticultural productions as are adapted to the soil and climate of Minnesota. Now, if this is the object of the Society it is its duty not only to recommend the best methods of accomplishing that object, but to oppose and denounce everything that is calculated to prevent it. I see before me the tree planter, the nurseryman, and the farmer, all members of one body, working together harmoniously. The natural inference is that their interests are identical, and the inference might be correct if it were not for another element that comes between the two. This element is notoriously scarce at horticultural meetings. I refer to the tree agent, not to the honorable, upright one, but to the sharp, tricky fellow who has no regard for the gray hairs of the aged, or the poor crippled defender of our country, if by fraud, trickery and lying he can sell inferior nursery stock at enormous prices. Two of these leeches can do more injury to horticulture in a county in one month than twelve honorable men can overcome in five years. They deserve the fate of the serpent that caused the expulsion of Adam, the first horticulturist, from the Garden of Eden. Surely of all humbugs the professional tree agent is the greatest. He is to an honorable man as a green persimmon is to the luscious peach. To illustrate their wily ways I will give some of my own experience and that of others in our county. Some five or six years since an agent from Dayton, Ohio, came into the county and sold stock to the extent of several hundreds of dollars. He was so oily tongued that he made some of the farmers believe that even prunes and pears would grow there. One poor German farmer was induced to buy nearly one hundred dollars worth. The stock delivered was overgrown and worthless, such as nurserymen are glad to sell for a song, and sing half of it themselves. The poor man not only lost his money, but the time spent in setting the stock out.

Last spring, as I was transplanting strawberry plants, there came into my field quite a portly fellow who introduced himself as an agent for a well advertised chain of nurseries, located in Wisconsin, Ohio, Kansas, etc., and stated that he was selling nice crown budded trees grown at Sparta, Wis. He exhibited a large number of specimens of wood cut from black-hearted Wealthy and Duchess root-grafted trees, also a specimen of wood, white and sound, which he said was cut from budded trees he had delivered at Arlington. He next exhibited root-grafts and a seedling root well supplied with small fibrous roots, which he claimed to be of French crab origin, and stated that they took a two-year-old French crab seedling, budded it, then let it stand three years in the nursery, when they sold a three-year-old tree on a five-year-old root. He said that where the union was made in root-grafts; mold formed, which was the cause of black-heart. He would warrant his trees, and if they died he would replace them. He offered to let me have half a dozen for five dollars. I told him I had not heard before that budded trees were hardier than root-grafts, that if such was the case I thought our nurserymen would prac-

tice budding, and that I would investigate the subject before buying. He next tried me on small fruits. I told him I had enough for the present. He said "Come and see what I have got." So I went with him, and I must say that greater devices for taking the eye and tempting the palate of the unsophisticated farmer and lover of fine fruits could hardly be devised. First, a grand display of pictures, showing fruits of enormous size and brilliant colors. Then bottled specimens by the dozen; huge arctic plums that were perfectly hardy as far north as Manitoba, for only one dollar each; Mrs. Garfield, the largest and most productive strawberry grown; Taylor's Prolific blackberry, the hardiest and best grown (mine freeze down most every year); Crimson Beauty raspberry, etc. When he got through with his false statements, I told him I had not patronized tree agents for several years, and did not intend to soon; that I bought direct of nurserymen. And he left to seek for other victims, of which he and his partner found so many that they sold several thousand dollars' worth of stock which has been delivered and is reported by some to be fine looking stock, probably from Ohio. And now, with anxious hearts, they will watch and wait to see whether their Wolf River apple trees produce crabs, or their Russian mulberry trees produce currants, as they did in Illinois. A short time since one of my neighbors called my attention to some thorn bushes that he had bought for evergreen hedge plants. They were as bare of leaves as a bean pole and looked like Osage orange bushes. And so I might go on *ad infinitum*.

Now let us take a retrospective view of the operations of these agents. They came into the county as perfect strangers, representing a firm that the people had never heard of, and selling kinds of trees and plants that were mostly unknown, at enormous prices to the poor, hard working farmers who toil early and late to raise wheat at fifty cents a bushel. I ask you in the name of justice if it is not high time some way was devised to stop this wholesale swindling. Such men deserve to be placed in a lower class than the highway robber of the plains. If they had their just deserts they would be keeping company with the Younger boys. I see before me nurserymen whom I knew to be honorable men; and I say to you, it is a duty you owe to yourselves as well as your patrons to help hunt down these unprincipled knaves. I say to the farmer, organize neighborhood clubs, send to our home nurserymen for price lists, buy stock of them that they have tested and know to be the hardiest and best, and you will be surprised at the amount of money saved.

We will now give our attention for a few moments to another style of humbugging the lover of fine fruit. You know this is a day of monopolies, and the nurserymen of the country have not been slow to follow the ways of the other fellows. Their usual method is to get possession of the whole stock of some new kind of plant or tree, put an enormous price on it, and then flood the country with special circulars illustrated with pictures of fruit of enormous size and brilliant colors, and setting forth in glowing terms the originator's story of its wonderful productiveness, great hardiness, etc. Ninety-nine times out of a hundred it will prove to the deluded purchaser either an utterly worthless humbug of an old sort with a new name, which might have been bought for a small sum. As examples I might mention the Big Bob strawberry, boomed by a prominent Eastern nurseryman, famous for such operations, who acknowledged the next year that several thousand spurious plants had been sold to him, and sent out by him to his customers. Then there was Fay's Prolific currant; nearly as large as cherries and three times as productive

as Red Dutch, a few of which will be sold for the very low price of one dollar each. Buy a few and save making ladders and climbing cherry trees. If you are fond of grapes, buy the Niagara, a small plant of which you can get for the trifling sum of two dollars. This is said to be the hardiest white grape grown, and will no doubt prove a bonanza to growers in the mild climate of Minnesota, but is pronounced too tender for the cold winters of Kansas.

Surely, with humbugs to right of him, with tree peddlers to left of him, with blizzards behind him, and blight, drought and tornadoes in front of him, the lot of the would-be fruit grower of Minnesota is not an enviable one. And when we see the poor farmer made the victim and prey of every kind of monopoly, we should not wonder to see the boys running away from the old farm and seeking the gilded attractions of the city.

DISCUSSION.

Mr. Harris spoke of the agents of Albaugh as among the class of humbugs mentioned by Mr. Cutler.

Mr. Underwood. Albaugh told me in Chicago, at the convention of nurserymen, a year ago last June, that he was going to send out parties, and sell them just what he wanted to, and furnish them with just what he pleased.

Mr. Tuttle. I would say I think he has picked up the greatest set of liars on the continent. [Laughter.]

On motion, the meeting adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

THURSDAY, JANUARY 21, 1886.

The meeting was called to order at the usual hour by President Smith.

QUESTION BOX.

The following question was read: "Has any person been humbugged by Minnesota nurserymen or sellers of nursery stock with head-quarters in this State?"

Mr. Underwood. Mr. President, my impression is that there are a good many who think they have been humbugged by Minnesota nurserymen. When I heard the question read I felt like saying perhaps no one is a bigger humbug than the man who buys anything, don't take care of it, and blames the nurserymen because it dies. There is

probably where the most of the "humbugging" comes in. I think if farmers would all come out and join the State Horticultural Society, help form local societies, and post themselves with regard to the setting and caring for nursery stock, and thus inform themselves so that they would know what they were getting and what they want, the same as they would do if they were buying a horse, they would not have so much occasion to talk about being humbugged by nurserymen. It is well enough to talk about agents, but it is usually wind expended without any beneficial results; you can talk and spout but you never drive the agents out of the country. It is better to put in time talking to farmers. Now, here is our friend Cutler that wasn't humbugged because he knew what he was doing, what he wanted, and was in a position where he could guard himself against humbugs. If there is any complaint anywhere I think the farmers had better go to work and post themselves so that no humbugging game can be practiced upon them.

Col. Stevens. I would suggest that the question be changed to read "Does anyone know whether the farmers have humbugged the nurserymen?" [Laughter.]

Mr. Pearce. A good many years ago I learned this maxim, "Experience teaches in a very dear school, but fools will learn in no other." Now, I am with Mr. Underwood in this matter. If men living in this day and age when the opportunities for informing themselves are so many, allow themselves to be humbugged, I say it is all right that they should be humbugged.

Mr. Barrett. Mr. President, I know that we are infested with agents in our locality, irresponsible men that are doing damage to the cause in which we are engaged. They injure the good reputation that we may have acquired. I don't suppose anything can be done, but some resolution might be passed that would have some moral influence. The organization of horticultural societies has done much to protect the people.

Mr. Fuller. There are certain classes of agents and a certain class of nurserymen, as well, that propose to impose upon the people; the agents of these firms go out for that purpose, and are a class of liars from the beginning to the end. They operate in one part of the country until they fill a large number of their worthless orders and away they go to some other part of the country. Those who buy their worthless stuff say, "I knew he was a humbug, but we couldn't get rid of him." They didn't have spunk enough to set the dog on him,

and so were compelled to give him an order. Nine-tenths of the farmers haven't energy enough to dispose of these agents summarily who visit them for the purpose of lying the thing through. I regard it no better than if they should come with a pistol and pointing it at their breast tell them to stand and deliver; and there are nurserymen that send out that class of agents.

Mr. Underwood. This tree business reminds me of the horse-trading business. We have got lots of men all over the country that are trading horses. They are good enough fellows in their way, but they will get a horse for seventy-five dollars, fix him up a little, and get \$125 to \$200 for him; while probably the horse isn't worth any more than they paid at first. Why don't the horse dealers get up a vigilance committee to see that every man that trades horses doesn't get cheated. I don't think our Society is called upon to act as a vigilance committee. People, as a rule, will take care of themselves, and I think it is wise to let them. Now, if you want to talk to the tree agent, you had better talk to him to his face and give him a chance; he will generally "stay" with you. I don't like to denounce a man when he isn't around. We can't all get honest Smiths for tree peddlers. I wouldn't guarantee to this Society that all our agents are strictly honest; I can't control them, and don't believe there is a man living that can.

President Smith. I will state, gentlemen, that we have a very large program to go through with this afternoon.

Col. Stevens. Before this question of humbugs is disposed of I want to say that I don't think myself, so far as I know, and so far as I have heard, that there has been any objections urged to the ten or fifteen leading nurserymen in the three states of Wisconsin, Minnesota and Iowa, but my friend Underwood I think takes a different position from the one he believed in last summer sometime. My reason for saying so is that I have learned that in McLeod County alone during the past year orders have been given for about \$6,000 worth of "budded fruit trees." The agricultural press is doing what it can; we send out about thirty thousand copies of our paper at every issue. That ought to accomplish something. I believe the fault, so far as we are concerned in Minnesota, is more with the farmers than in the nursery-stock, because they don't take proper care of it.

Mr. Cutler. As it has been insinuated that the farmers are an ignorant class, especially upon this subject, I feel compelled to state a circumstance that occurred in our county (McLeod). A gentleman

came to my place claiming to represent the Jewell Nursery Co., of Lake City, and stated that he had been down in Kansas. I think he said his name was Ambrose; that he had written to the "old man," as he called him, (I suppose he meant Mr. Emery) and told him if they would allow him to work the budded-fruit dodge through there upon the farmers he could make it pay well. He took out a letter and read from it: "We do not propose to place a club in your hands to beat our own brains out." Those were the words which he claimed to have received from the Jewell Nursery Co. This same agent also stated to one of my neighbors, who gave him a large order for forest trees,—some 2,300 I think—the games that he practiced upon the farmers of Kansas to get their orders; and he replied that he didn't want him to try to work any such games upon him. It has been suggested that the farmers should attend the horticultural societies, but it is very difficult for a large part of the farmers to leave their business at home. Furthermore, these agents work up some new device each year.

ANNUAL ELECTION OF OFFICERS.

President Smith announced the next business in order the election of officers for the ensuing year.

The following officers were then elected:

President—Wyman Elliot, Minneapolis.

Vice Presidents—Messrs. A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; F. G. Gould, Minneapolis; and G. W. Fuller, Litchfield.

Secretary—S. D. Hillman, Minneapolis. .

Treasurer—J. T. Grimes, Minneapolis.

Executive Committee—J. S. Harris, chairman, La Crescent; J. M. Underwood, Lake City; Truman M. Smith, St. Paul; Ditus Day, Farmington, and M. Pearce, Minneapolis.

Librarian—E. A. Cuzner, Minneapolis.

Entomologist—O. W. Oestlund, Minneapolis.

The following were named as a Committee on Publication: Col. J. H. Stevens, C. L. Smith, and S. D. Hillman.

On motion of Mr. Cutler, the President was instructed to appoint a committee of from one to three, according to the condition of the treasury, to visit the blackberry plantations of Mr. Hamilton, of Ripon Wis., the coming season, and report to this Society, at its next annual meeting.

On motion it was ordered that hereafter the President and Secretary shall hold their offices and discharge their respective duties during the entire session of the Society at which their successors shall be elected.

Mr. Cutler offered the following resolution :

Resolved. That each member of this Society be constituted a committee of one to notify the Secretary of this Society of any operations of swindling tree agents, the Secretary to furnish the names of such agents to be published in the principal papers of the State.

President Smith. While the the resolution in its spirit is good, in carrying it out there may be danger of getting this Society into a good deal of trouble, and rendering the Secretary liable to be prosecuted for libel. Some man may think he has been swindled when he has not, and we may have some vexatious and expensive litigation on our hands. I think we had better keep clear of it; do all we can to inform the people, but not in such a way as will get ourselves into any legal trouble.

A Member. I think the best way is to let the farmers learn by experience. It may take some time and cost them something to learn, but if they want trees, it is better for them to go to some responsible nursery for them, and they will avoid being humbugged.

Mr. Gould. The motion is, as I understand, that each member is to send names of agents that they may regard as doing a swindling business, to the Secretary, who shall publish the names in the leading newspapers. This would certainly involve the Society in litigation; libel suits are very common nowadays, and they are suits for big damages. I think we had better be a little cautious.

On motion of Mr. Pearce the resolution was laid on the table.

Mr. Cutler. I have one more resolution that I will offer :

Resolved. That this Society hereby advises the people of the State to give the agents claiming to represent the claims of nurseries of Albaugh & Co., a wide berth.

Mr. Underwood. I don't see why this Society should want to pitch into any nursery. I think we had better disseminate what knowledge we have and let the nurserymen alone. I wouldn't care how much you pitch into me, but I don't like to see my brother nurserymen abused. I don't think it is the business of this Society to take up cudgels of this kind. Col. Stevens will publish in the *Farm, Stock and Home* anything in the way of complaints that may be made, and so will other agricultural papers, and you can blow our nursery or any other nursery, of Ohio or New York all you want to.

Mr. Sias. Mr. President, this is a subject that I never have spoken on, but I believe it is a principle that ought to be acted upon that the strong should help protect the weak, as far as they can, consistently.

Now, our Society has been teaching us for nearly twenty years how to protect ourselves. We have been posting ourselves, and guarding ourselves against humbuggery. We don't need to do anything to guard Mr. Underwood, but there are a great many farmers that never come into these meetings, and many of them live so far away that they can't get here. I have been here a good many sessions, and try to do a little something to guard against humbuggery. Some of our best members don't believe in stirring up these things; it is true we have always had enough regular business on our program, but I would like to see this resolution pass; I believe we ought to do something to show these irresponsible agents and foreign tree venders that we are not to be imposed upon. They are hurting Mr. Underwood; they are hurting me and every man that is trying to do an honest business in this State. They are doing probably nine-tenths of the business in this State. They are bringing in trees mostly from Ohio and New York. Their trees, as a rule, are good for nothing, for this climate. If we submit to it, why it will go on, and the farmers will call us humbugs.

Mr. Gould. I don't see how in the world the farmers are going to distinguish between the agents of the different nurseries. I think there are honest men in the nursery and tree business, as well as some humbugs in that business. Now, I wouldn't draw any line between them in a public way. I think it is entirely out of place. I think the tree-peddler is a civilizer. I believe that he and the Methodist preacher go hand in hand; [Laughter] he is a horticultural colporteur. He spreads a knowledge of fruits and flowers among the farmers and makes their families happy. I believe one is about as important as the other.

Mr. Latham. I do not see the use of publishing the resolution after everybody in the State have purchased their trees; these agents are going through the country all the time; everybody will have bought their trees and have them planted before our report is published, and if it is determined to pass such a resolution at all, I move to amend the resolution by requesting the press to publish it over the signatures of the officers of this Society, and have it done to-morrow.

Mr. Pearce. These agents will probably sell just as many trees, and we may possibly get ourselves into a lawsuit. Suppose we got into court. It would be like this: Witness would say, "I know nothing about it; but I presume it is true." Hearsay testimony don't count with the courts.

Mr. Harris. We have given this matter a pretty good airing by the discussion we have had, and I suppose some of it will get into the daily papers; I think that is all we ought to do.

The question on the adoption of the resolution was then taken and lost; ayes 15, nays 16.

The following communication from Hon. William G. LeDuc, of Hastings, Ex-Commissioner of Agriculture, was received and placed on file for publication :

THE NEW AGRICULTURE.

HASTINGS, MINN., January 18, 1886.

S. D. Hillman, Secretary, etc.

DEAR SIR:—A severe cold (or what is usually understood as such) has for the past ten days kept me at home closely and will prevent my attendance at the meeting of our Minnesota Horticultural Society commencing to-morrow. I promised you if nothing prevented I would be in attendance and take part in the proceedings. As I do not think it prudent to attend in person the nearest approach I can make is to submit in writing briefly some few thoughts pertinent to the matter that will be under discussion.

It may have come to the notice (in a general way) of some, perhaps all the members of the Society that the system of drainage, irrigation, and ventilation, affecting the roots of trees and plants has been proposed and indeed carried into practice with very remarkable results by Hon. A. M. Cole of New York state, a system to what he gives the name of "The New Agriculture" and which he fully describes in a book, of that title, recently published. Mr. Cole claims that by his system, the soil may be made to produce ten times as much, as by ordinary cultivation. His claims, submitted to personal examination and criticism of some of the best and most conservative farmers of his state, men like himself advanced in years and cautiously wise with a lifetime experience, have been favorably endorsed and approved. The soil he selected for his trial field was a few acres, sloping to the East; included 4 feet in 100; a clay loam more or less stony, with a compact subsoil which his workmen in digging the necessary trenches found tough and solid enough to make it slow pick work. This was poorer than the average of a very poor field of which it formed a part.

Along the face of this slope, trenches were dug four feet deep and two feet in width, following the superficial curvature of the slope but maintaining the depth from the surface and also the level of the bottom of the trench from end to end. This trench he filled with stones of all sizes and kinds to within fifteen inches of the general surface of the slope, then covered with flat stones carefully laid to prevent the interstices being filled with soil and on the top of the flat stones placed coarse refuse, material of any kind, grass, stalks, weeds, anything to hold back the earth. This ditch was in effect a reservoir to hold back the water from melting snow, or rains. The stones serve to support the earth covering the reservoir. At a distance of a few rods, a parallel ditch was dug of exactly similar character filled and covered in the same manner, and these two ditches were connected by transverse ditches constructed in the same manner only smaller, leading however from the upper ditch about a foot from the surface, the effect of these shallow transverse ditches being to carry off any overflow or surplus water in the ditch

above. Other parallel ditches connected by transverse ditches were constructed to the bottom of the slope intended to be cultivated. The earth was then thoroughly cultivated over and between and nearly as deep as the top of the ditches. The grounds thus prepared by Mr. Cole for his first experiment were two acres in extent, which was planted mostly to strawberries. The results appear to have been so remarkable as to challenge the credulity of those who had not made personal examination. A visitor who inspected carefully Mr. Cole's place on the 7th of July last, writes concerning these strawberry plants, which were planted in Oct. 1884. "I never saw anything like it. There was a full crop of most remarkable berries, remarkable in size, color and quality, the yield was certainly very large; one plant of older setting, had enough berries I thought to fill my hat, if all ripe and green had been picked at one time; and there was no core, no stem, they were tender and juicy all the way through—not good berries to transport a long distance to market, and the foliage was wonderful. I measured one leaf that was five and a half inches across. An apple tree standing in this improved land reported as worthless, its fruit gnarled and valueless, before the land was trenched, is now bearing largely and its fruit of fine quality." Another visitor reported the results were astonishing both as to the size of the fruit and the quantity produced. It is no exaggeration to say that more strawberries per acre in bushels can be grown by Mr. Cole's new agriculture than the old agriculture can produce of potatoes under the most favorable circumstances. Another advantage claimed by Mr. Cole for his method is that in the locality in which he resides, it furnishes a constant supply and flow of pure spring water from the lowest trench, and that in the coldest weather the surface of the soil only is frozen, that frost will not be able to penetrate to any depth beyond a few inches, because of the constant flow of spring water.

In calling the attention of this Society to this New Agriculture of Mr. Cole, I prefer to state the bare facts and leave to each one such application or inferences as may seem proper. That it is a new departure well worthy of careful examination and experiment is certain. It also occurs to me that a statement of another method of irrigation, which I saw in use in California orchards in 1883 might prove of interest, possibly of value, to some of the younger and more enterprising members who desire to experiment in this direction. And it is my opinion that by the profuse use of water in our gardens and orchards we can very largely increase the profits of our lands and labors.

IRRIGATION IN CALIFORNIA.

An enterprising California fruit grower laid pipes made of cement and sand under ground through his entire garden and orchard grounds, which were between Sacramento and San Francisco, where the rainfall is usually sufficient to secure a good crop of fruit. By means of these pipes he was able to keep the trees supplied with any amount of moisture desirable; by drawing a plug he could water any four trees in any part of his orchard. The pipes being porous, leaked the water slowly when kept full and thus kept a constant equable supply ever present to the whole area in which the pipes were laid. The quantity of his fruits was largely increased and the appearance and quality improved, and he was able to command higher prices for his product than other growers. This success led to the introduction of the system in the more arid parts of California, and the finest orchard of oranges, lemons, limes and olives I saw anywhere on the west coast, was near the southern limit of the

belt of extra tropical rains and where the influence of irrigation was most strikingly manifest in the luxuriant growth of trees and fruit. This orchard irrigated by the subterranean system of cement pipes, was 18 to 20 acres, the flat on top of a ridge which outside of the irrigated area was as barren as a travelled highway in midsummer. The water was raised by wind power and managed from the tanks by one man, only a part of whose time was required daily to do the same work that required two and sometimes three men one week in each month. Having for a long time been of opinion that even in our favored land we could profit by a judicious use of water, I had hoped some parties interested in gardening or orcharding might make some experiments in irrigation and report them to the Society. I know that some few persons have watered patches of berries in an unmethodical manner and without keeping any accurate record, and have acknowledged the benefits accruing therefrom, but no one in our State or so far as I know, in any part of the United States east of the 100th meridian of longitude, systematically applied water to the specific use of increasing the profits of farming, except Mr. Cole, who in the dry weather last season put a team at hauling water from the Vermillion, one quarter of a mile and thoroughly soaked strips about twenty feet wide through a strawberry patch one quarter of an acre in extent; the team was employed three days at one time and two at another, and the results were so satisfactory that I will, if possible, irrigate this year in systematic manner so much of my garden grounds as I can, and should any member of the Society desire any further information as to making the concrete and laying the pipes for sub-irrigation, I will be pleased to give them in detail any information possessed by myself. It occurs to me that a garden plat underdrained in this manner by pipes, could be raised in temperature in early spring or late fall by filling the pipes with hot water, the advantages of which will be apparent to all.

It should be remembered that an improper use of water may prove not only detrimental but also sometimes disastrous. Thus, surface irrigation of a clay soil in mid-summer may harden the surface and render it impervious to the air, light and moisture necessary to the vitality of the tree or plants, or too great a supply of water in loose, friable, spongy soils may induce the roots to take up a larger supply than the tree can safely use, thus enfeebling the tissues and weakening its vitality so that it may suffer and possibly die under the heats of our sometime torrid summers; but this whole subject is one which I am sure is worthy the careful examination and attention of our horticulturists and farmers, and to them I desire to commend its practice experimentally.

On motion, the meeting adjourned until 7 o'clock P. M.

EVENING SESSION.

THURSDAY, JANUARY 21, 1886.

The meeting was called to order at the usual hour, President Smith in the chair.

The committee on the President's Annual Address presented the following:

REPORT OF PRESIDENT'S ANNUAL ADDRESS.

Mr. President and Members of the Minnesota State Horticultural Society:

Your committee on the President's Address beg leave to make the following report on those points that they consider of most importance to the future welfare of this Society.

The attention of members is called particularly to the question of our finances so ably explained by our worthy President. By instructing our treasurer to comply with the requirements of the State auditor to use the reserve fund (set aside for the paying of premiums on long keeping seedlings of good quality,) our Society can have money to carry on its work this year; and, when the legislature meets, we can have our laws so changed that we can set apart a portion of our yearly appropriation for a sinking fund to pay premiums of the future, for long keeping seedling apples. We recommend the appointment of a representative to the American Horticultural Society at its next annual meeting, and the paying of his travelling expenses, without any salary attached to the position for services so rendered. A full report from such delegate will be expected at our next annual meeting. A committee on legislation, as suggested, is very necessary in order that they may determine as to necessary legislation in the interests of this Society before its next winter meeting; and the committee should be appointed at the present time. The committee should consist of not more than three in number and be centrally located, where they can confer with each other without great expense to the Society; and if members will communicate with them and make such suggestions on legislation as they may deem proper it would no doubt redound to the interest of our Society.

The suggestion in regard to the premium list on horticultural products being made out early and presented to the State Board of Agriculture, is a good one and it is hoped our Executive Committee will act promptly in this matter, taking the suggestions of our worthy President as a guide in their deliberations.

We heartily endorse the suggestions made concerning the proposed Summer Meeting at our State Experimental Farm, under the management of Prof. E. D. Porter.

We approve the suggestion of the President, that instead of offering agricultural papers we give a membership fee in the Society at the coming June meeting, on second, third or fourth premiums, for the sum of one dollar.

WYMAN ELLIOT,
J. S. HARRIS,
A. W. SIAS,
Committee.

Mr. Sias here took the chair, and President Smith offered a resolution that the incoming president be chairman of the Legislative Committee of three, and that he be authorized to appoint the other two members of that committee.

Adopted.

On motion of Mr. Cutler it was voted that the Society accept the invitation of Prof. Porter, that the Summer Meeting be held at the University Experimental Farm.

Mr. Harris, from the committee on Districting the State presented a report which was adopted:

DISTRICTING THE STATE.

Your committee appointed at the Annual Meeting, in January, 1885, to divide the State into fruit districts, following the plan adopted by the Iowa State Horticultural Society, would respectfully report that after due consideration they deem it inadvisable at the present time to make any change in the system now in use by our Society.

J. S. HARRIS,
WYMAN ELLIOT,
Committee.

The following paper was then read:

THE CULTIVATION AND ADORNMENT OF SCHOOL GROUNDS.

By MRS. C. O. VAN CLEVE, Minneapolis.

Mr. President:—

The subject assigned to me on this occasion is of great interest to all of us, and it is gratifying to all who have at heart the best interests of the rising generation to have it brought before the Society. I am to speak now of the beneficial effects of cultivating and adorning our school grounds, and making them a factor in the education of our children. The best way to carry this measure into effect is for afterthought and discussion.

Not only would our school houses look more attractive in the midst of beautiful flowers and ornamental trees and shrubs, and become an element of beauty to cheer and gratify the passers by, but upon the children of the schools the moral effect would be most salutary. Children learn many things at school that are not in the text books, and the eye takes in much that has power in forming habits and in waking up aptitudes.

And there is something elevating, refining and improving in surroundings of this kind; the impressions made on young minds through such channels, though perhaps not fully realized at the time, are lasting as life. Very many influences are conveyed imperceptibly to the mind and heart through what we see from day to day; the truth of this assertion all will acknowledge. There is a story, which may be familiar to many, of a farmer's son, who, brought up far away from the sea or other navigable water, in poverty, obliged to work hard every day, having little time to read and scarcely anything to divert or amuse him, developed an intense desire to go to sea and urged this so strongly that his parents consented. But it was a matter of wonder to them when and how he had imbibed such taste, as there seemed nothing about his home or associations to inspire or foster them. At length, the mother's eye lighted upon an old cheap picture which had hung over the mantel piece for years and had become very dim and indistinct in the smoke and dust, representing a ship at sea, tossing on the billows in a storm, and she felt that this picture had been the boy's inspiration, that imperceptibly there had come into his mind through its influence his ardent desire to be a sailor. Picture the tired boy as coming in from his labors and sitting by the ample fire place, drawing in comfort and cheer from the blazing logs, and ever and anon contemplating the one poor decoration of his humble home, till it awoke in his breast inclinations that took full possession of him, gave him an intense longing for a "life on the ocean wave" and shaped his whole future life.

Then think of the many children who come to our schools from bare, desolate homes, whose only hours of ease and comfort are those spent in and about the school house, whose only opportunity for receiving good impressions is the time spent at school, and try to realize what a powerful influence on their lives might be the beautiful, restful surroundings in these cultivated school yards and grounds. Many children will go out into the world empty handed to fight the great battle of life as best they may; some will be established in business by fathers able to give them a start, but all will be exposed to temptation, and the impressions received while at school will have much to do in forming their characters for good or ill. When tempted to go astray they may be influenced by the sweet memories of their

happy school days, and the sight of some tree or flower such as grew in the old school yard may call up the innocence of those days, and the salutary teachings received there, and save them from sin.

A poor creature had fallen into a drunken sleep on the steps of a building in St. Petersburg, Russia. A saintly woman who had been carrying flowers to the sick in hospitals, passed that way, and stopped to look in tender pity on the poor, sinful girl. She would not waken her, but taking from her basket two or three pansies, left over from her work, she laid them tenderly on her breast and went on her way with a prayer in her heart for her poor lost sister. Hours after, arousing from her stupor the girl found them there, and burst into tears at the sight. She wailed out, "The morning I left home to find work in this great city, my mother gave me a bunch of pansies, and God must have sent them to me to call me back to my home, I will arise and go to my mother." And we read that she was saved and became a good, true woman.

A few years ago, a young man lay dying in this city; he was going out in the dark, he did not know the way. Christian friends labored lovingly with him and urged him to give his poor broken heart to the blessed sympathizer; they grew to love the poor boy, far from home and friends, but could not seem to touch him, till one day a lady gave him a few geranium leaves to cheer him. As he took them in his poor wasted hands, and drew in their fragrance his heart melted, tears came, and in broken tones he sobbed out "Mother had a geranium in her window at home and this smells like it." Remembering then his mother's undying love and her gentle teachings, he gave himself into the arms of the pitying Heavenly Father, owned his need of him, and died trusting in his Savior, while the leaves were in his hand.

We can all remember the story of Azim, the tempted youth in Moore's beautiful romance of "Lalla Rookh," who was kept from temptation by memories of flowers called up by the sweet song:

There's a bower of roses by Bendemeer's stream,
And the nightingale sings round it all the day long;
In the time of my childhood 'twas like a sweet dream,
To sit in the roses and hear the birds sing.

That bower and its music I never forget,
And oft when alone in the bloom of the year,
I think—"is the nightingale singing there yet?
Are the roses still bright by the calm Bendemeer?"

No, the roses soon withered that hung o'er the wave,
But some blossoms were gathered while freshly they shone,
And a dew was distilled from their flowers that gave
All the fragrance of summer, when summer was gone.

Thus memory draws from delight ere it dies,
An essence that breathes of it many a year,
Thus bright to my soul, as 'twas then to my eyes
Is that bower on the banks of the calm Bendemeer.

These few instances may suffice to show the salutary effects of "Nature's silent teachers," and now the question is, how may this idea of surrounding our school houses with beautiful things be carried out?

Although many will admit that it would be of lasting benefit to our children, yet doubtless some objections may be raised by practical people who can see no use in all this.

The first objection raised will probably be that such grounds as are proposed could not be kept in order, the children in their plays would destroy them. Well, that has weight, but in laying out the grounds, a part could be reserved for a stamping ground where the boisterousness might be worked off, for we who have brought up children know they must have a chance to romp and make a noise, and we would not entirely restrain this bubbling over of animal spirits, but a part of the plan proposed would be to teach them to respect the rights of others, and a pride in the ornamentation of their school surroundings could be so encouraged, that they would feel a sort of ownership in them and would foster the beautiful things and guard them from harm. In a township near Columbus, Ohio, an acre or more of ground surrounds each school house in which are various kinds of trees, shrubs and evergreens and a teacher is made responsible for the preservation of the plant and trees. A plan is proposed by an old school teacher in that state that might work well here: "At a certain time of the year suitable for the purpose, there should be an Arbor day and the trees should be planted by the pupils, who would feel a sort of interest in them and protect rather than destroy them"—there too the girls might have flower beds and plant seeds, set out roots and slips under wise guidance, thus all would learn much of tree culture, of the habits of various plants, and botany would thus be taught in a most practical way. This plan, too, would train and educate a great army of helpers in our horticultural societies, who would understand thoroughly what can only be learned by practice and experience, and would be prepared to give to the public the benefit of their knowledge.

I have thought there might be auxiliary horticultural societies in our schools from which should come delegates to our regular meetings, bringing reports of their work, the preparation of which reports would be of great benefit to the young people, and, it may be the older ones could gain some hints from the experience, the successes and failures of the children. Such auxiliaries properly organized would be exceedingly stimulating, and the officers would carefully guard these experimental school gardens from depredations.

In the care of children, I have noticed that giving them something to do and holding them responsible for the doing of it, making them feel that it is their work entirely, acts most beneficially, and while learning lessons which would do them good all their lives, from this work proposed for them, they would be fitting up little parks all about us, thus conferring great pleasure and benefit upon the whole community. And not least among the benefits to be derived from this scheme, would be furnishing occupation for leisure hours and leaving no time or room for that mischief which wise old Dr. Watts tells us "Satan finds for idle hands to do." Then as a measure for encouraging in our children a love of nature's beauties; for promoting and stimulating pure healthful thoughts and inclinations; for awaking up feelings and impulses which make lasting impressions for good on the young lives for whose future we are in a measure responsible, and for lighting up our

beloved State with bits of brightness and beauty which shall be a joy forever; let us, as a Society, exert our influence in this matter of cultivating and adorning the play grounds, where our children spend so much of their time and where they are receiving impressions which shall be as lasting as their lives.

And permit me to say a few words on a subject not down in the bills, I mean the adornment of our railroad stations.

Who has not felt the restful, cheering effect of the miniature parks bright with flowers and foliage, to be seen at the stations on some of our roads? Why may not these refreshments for the eye become general?

They would be very little expense, the station agent could oversee them, and in most cases would enjoy doing so, for his own pleasure and that of his family. And who knows but some weary traveler may be reminded by a pretty, fragrant flower of home and mother's teachings, and turn away from the saloon right across the way? A less thing than a flower has been used as the agency to save a man from ruin. Have you read the exquisite tale of "Picciola" by Sanitine? if not I pray you do so as soon as you can.

It is the story of a French Count who languished for years in a prison on account of his political views, during the reign of Napoleon the Great. He was hardened against kindly influence, despairing and bitter, and had lost faith in God and man. One day walking back and forth in the narrow court yard, with nothing to interest him, a prey to his gloomy thoughts, his head cast down, he began to count the stones in the walk by way of diversion, and perceived a little mound of earth raised between the stones and slightly opened at the top. So monotonous and bare was his lonely life, that this change, insignificant as it was startled him; he grew excited wondering what it meant. Stooping over the little mound, he very carefully removed some particles of earth and saw a feeble specimen of vegetation with scarcely strength to sprout, weak and languishing; he was about to crush it with his heel, when a fresh breeze wafted to him the perfume of honeysuckle and heather, and checked the act, with the thought that some day, this little embryo might have perfume to give him. Then he began to reason, how was it possible for that minute plant so weak, so soft, so fragile, to throw out that earth, dried and hardened by the sun. He became interested, examined it more closely, saw how its first leaves were protected by a sort of double fleshy valve, so that nothing could injure them, and his mind was awakened and turned out of his gloomy thoughts. And the story of how day by day, he watched that plant expand, how tenderly he nurtured and watered it, how he grew to love it with the devotion of a lover, and how it became to him an evangel, lifting up his heart to the God whom he had denied, giving him patience to endure and inspiring him with hope, and how in some way his beloved "Picciola" was instrumental in his restoration to freedom and great happiness, is most touching and fascinating.

For beauty of style, ingenuity of method, purity of sentiment and sound convincing argument on the reality and power of the Christian faith, it has no equal in uninspired literature and should have a conspicuous place in every horticultural library.

And now if the premises in the foregoing are correct, it seems clear that a part of our duty as a Horticultural Society, is to implant and foster in the minds of our youth a genuine intelligent love for the culture of plants, and the plan suggested

for the adornment of school grounds would, if carried out, be a most efficient means of accomplishing this desirable end. Hoping that some abler pen and more eloquent tongue than mine, will take up the cause and so represent it, that at our next annual meeting we may point to actual and satisfactory results, I leave the subject in the hands of the Society, with earnest wishes for its steady growth and increasing usefulness.

On motion the editors of *Farm, Stock and Home* were requested to publish Mrs. Van Cleve's address entire, as soon as they can find room to do so in their paper.

The following paper was then read:

FRUIT CULTURE IN SOUTHERN DAKOTA.

By MRS. L. A. ALDERMAN, Hurley, Dak.

Mr. President and Members of the Minnesota Horticultural Society:—

Your Secretary having requested of me a report of the progress made in fruit culture in Dakota, I shall first escape, prefacing my remarks with an apology, by stating that I greatly regret being prevented, by unavoidable circumstances, from securing more thorough information on the subject treated, that possibly I might give you approximate value for your time trespassed upon.

You will readily guess that we in Dakota have not escaped the tidal wave of disaster that has overtaken the horticultural interests of the country, and which in the northwest have threatened to dethrone Pomona herself.

Doubtless Minnesota has suffered more than we, owing to her orchards being older and exhausted by fruiting, but here, as there, we, as horticulturists are anxiously asking "What of the night?"

Saying nothing of the thousand worthless trees shipped in by the tree-venders, whose death was a foregone conclusion, there were a few sorts popularly called "Ironclad" that we had fondly hoped to acclimate; among them were Haas, Pewaukee, Wolf River, Mann, Plumb Cider, Utters, Red Astrichan and others of like hardiness, these are our failures. Among those of not altogether broken promise are the Fameuse and Walbridge, although this is very near the northwestern limit of their usefulness.

With us, as with you, the Wealthy and Duchess seem to be the sheet anchor of our Pomology, and I give them in the order of their value and hardiness as exemplified on our own ground; and from advices received I am led to infer that this was true of most parts of our Territory, yet not universally so. When we have solved all of nature's mysteries pertaining to fruit raising we shall know what manner of soil and location are best suited to the needs of each variety, and then we shall know why these things are so. In this connection I will mention that the well-known fact that large rivers or other bodies of water make favorable conditions for fruit raising is exemplified along our southern border where the ameliorating influence of the great Missouri makes success possible with a line of fruit quite unknown beyond its softening influence; indeed a moderate success has been met with in peach

raising. In Yankton I have seen peach trees loaded with their luscious fruit, and I am told that in Bon Homme County the Northern Spy and other apples of the extreme East are raised. But one cannot judge of Dakota proper as a fruit growing territory by this narrow strip skirting her extreme southern border, and excepting the Duchess and Wealthy, I know of no standard apple that is a pronounced success in the territory at large. True, the Haas, Walbridge, Fameuse, Pewaukee, and even Ben Davis have been fruited here, and other sorts that the owners could not designate, but as a rule, their days were few and full of trouble.

Yet nowhere do the apples that are a success attain a greater perfection than here; perhaps I cannot better illustrate the adaptability of the Duchess and Wealthy to our condition than to mention that on our grounds a Duchess six years old, five and one-half feet high, perfected thirty-two fine specimens of fruit; also, that a limb of a Wealthy one year old matured sixteen well developed apples, said limb being but one-half inch in diameter; it is but fair to state that this limb bore most of the fruit of the tree.

In an orchard of eight hundred young Wealthys four years old, quite a per cent of the trees displayed blossoms and numbers of them bore one, two and three apples, the wonder and admiration of all who saw them. Mere bushes with tiny whip-like branches terminating in a luscious apple that would have tempted Eve herself.

With the Duchess, Wealthy and the Hybrids, headed by Whitney's No. 20, supplimented with the fittest of the Russians, when their fitness shall be proven, and the new sorts that your own Gideon, Sias, Harris and others are developing for us, it is no wild dream of the visionary enthusiast to believe that we shall shortly have a line of apples whose perfection leaves nothing to be desired.

Apropos of this, the record of the Whitney No. 20, as a tree for Dakota planting is worthy of special mention, having passed through the last two winters unharmed. Our most remarkable fall just passed has also failed to lower its record. On the night of the fourth of September last, ice formed one-half of an inch thick, this being our first frost of the season, being followed on the sixth by a warm, copious rain, and conditions most favorable to plant growth during the remainder of the month. October fifth was ushered in with another solid freeze; it being our second frost, the result was most disastrous to tree life. Young native plum trees that had made a rank growth were killed to the ground. The Wisconsin Weeping Willow on low ground having grown most luxuriantly was also dead; the effect on the White Willows were most noticeable, being killed on low ground but unharmed on the higher land. The effect on the tenderer sorts of the apple family was more or less discoloration of the season's growth.

Our orchards have been comparatively free from insect pests, but already the blight has worked great injury. This is especially true where the orchards have been literally cremated in oven-like enclosures of tall cottonwood, or other forest trees. Still the Siberian and Russians are not exempt on any site and doubtless the propagation of many of them will have to be abandoned for this reason; notably the well-known Hyslop and Transcendent; but for this the Hyslop would be a great success here, bearing early and abundantly such fine fruit as to cause those familiar with it in the East to doubt its identity.

Our soil seems peculiarly suited to grape culture of the hardy sorts. Mr. Terwilliger of the County of Turner has met with most flattering success in grape growing

on what would be considered an unfavorable location; being on rich bottom land, but a dense grove of cottonwood just north of his vineyard seems to make the location perfect if success is the criterion. Mr. Terwilliger stated at the meeting of our Horticultural Society that in sending grapes to Fredonia, N. Y., to be named he had repeatedly been told that he grew finer specimens of the same variety than they could produce there. And by the way, Janesville grapes raised by this gentlemen took the first premium at Minnesota State fair some four or five years ago; he this year fruited nineteen different varieties of grapes and has thirty-five sorts growing, has excellent success with Janesville, Worden, several of Rogers, Hybrids, Moore's Early and the Lady; still the ordinary care, or lack of care, which our vines receive will not insure success with grapes of even the Concord type of hardiness and the Janesville promises to be the most valuable grape for Dakota yet produced. I have not yet known of an instance of its being affected by mildew, our drier air preventing this tendency perhaps.

Cherries are among the uncertainties of our horticultural products. In the river fruit-belt they are a moderate success; outside of this they are not reliable, although on our grounds forty trees of the Early Richmond variety have stood the test of eight years without injury until a belated freeze in May last nearly killed them just as their buds were swelling into active life.

The plums that are useful to us are of course the best of the wild ones; our Desota and Forest Garden heading the list. Of the smaller fruits, the currant and gooseberry are an assured success. Of raspberries, the blackcaps are a partial failure without winter protection. Among the red the Turner has perhaps given a better equivalent for money invested than any fruit planted by Dakotians. When once it has taken root, it is as tenacious of life as is the prairie grass itself, and will yield some fruit even with absolute neglect, although it then gives hardly a hint of its great possibilities. The Cuthbert has been tried but is not hardy, and needs winter covering. Strawberries find a congenial home on our Dakota prairies, and nowhere can they be found in finer perfection, indeed our responsive soil and hot summers seem to be peculiarly fitted to produce vegetation of almost tropical luxuriance, and fruits of the finest flavor and superior size.

Although not coming under the head of fruit culture the Flora of Dakota is worthy of more than a passing notice, commencing with the "Wind flower" a species of *Anemone* that comes up in the earliest spring, dotting the prairie with what are in effect tulip-like flowers (the flower so called being really the colored calyx of the flower). We have a succession of most beautiful prairie flowers till frost, many of them quite worthy of cultivation. In our ravines and along streams the Bitter Sweet, American Ivy, Hop and wild Clematis revel in tangled luxuriance. Of cultivated shrubs the half-hardy ones are just tender enough for the Dakota planter to escape success with them, but some of the most beautiful roses, as the Moss, many of the Hybrid Perpetuate and not a few of the older sorts flourish here, and while the edict of the ice king has gone forth forbidding us the half hardy pets of the eastern garden, nature offers no insurmountable obstacle, and the possibilities are wholly within our grasp of making in Dakota, without noticeable lack of fruit, flowers or vegetable products, the grandest of American homes, which in the best sense are the grandest in the world.

The following report was then presented by Prof. N. H. Winchell of Minneapolis.

ENTOMOLOGIST'S REPORT.

MINNEAPOLIS, MINN., Jan. 19, 1886.

To the Minnesota Horticultural Society.

Your partiality, a year ago, elected me, as a member of this Society, to the position of State Entomologist. This was done in spite of my protestation of inability to discharge the duties of the position. I can barely distinguish a coliopter from an aphis, besides, my hands are more than full of fossils, minerals and rock-strata, not to mention soils, clays, mineral waters and building stones. I am weighted down; and sometimes I feel as if I should be swamped.

Yet I do not want to ignore the action of this important Society, nor to decline ungratefully the honor which you thrust upon me. In pursuance of the resolutions of the Society some action was taken toward the proper legislation to make a permanent foundation for entomological work in the State, and I wish here simply to relate those steps, as a kind of executive report, and to refer you to Mr. Oestlund for more special facts relating to the entomology proper of the State.

The resolutions adopted last year were as follows:

Resolved. That it is the sense of this Society that there should be appointed, and maintained, a state entomologist, a resident of the State, who should be authorized and instructed to disseminate useful information to the fruit growers and farmers of the State, respecting insects injurious to vegetation.

Resolved. That the legislature now in session be requested to make the necessary provision by the enactment of the necessary law to carry out this plan, and by the appropriation of the sum of one thousand dollars per annum for that purpose.

Resolved. That it is the sense of this Society that the information desired should emanate from the State University, and that such published information should be as rapidly and cheaply supplied as possible with correctness and thoroughness.

In accordance with these resolutions a bill was introduced in the House of Representatives of the last legislature, intended to answer the demands of the fruit growers, appropriating the sum of one thousand dollars per annum. It was referred to the proper committee, but when it came up for final action it was indefinitely postponed. Although there was a committee of this Society appointed to confer with members of the legislature respecting it, yet it does not seem to have been fairly presented before any committee, and was simply ignored from lack of active friends.

Still, though this effort failed, all was not lost. Through the agency of the geological and natural history survey, in previous years, some investigation in the entomology of the State had been carried on by Mr. Allen Whitman, and some valuable reports on the Rocky Mountain locust, by Mr. Whitman were published in the annual reports of the survey in 1876 and 1877. I brought the matter again before the Board of Regents, and recommended the resumption of entomological work, at least in some directions. The funds of the survey do not warrant the full equipment of this department, and it was not possible to employ a man fully and only on entomology. Mr. Oestlund was appointed to serve as a general aid in the laboratory of the survey, and in the museum, with the instructions to be engaged on all occasions when his time and other work would permit, in his favorite pursuit of ento-

mology. He had made a series of observations and many collections during the previous summer, on the insect injuries to the cabbage, under the direction of Prof. Porter, at the Experimental Farm of the State University. The observations were put into completed form and were published in the annual report of the survey for 1884. I have had some favorable comments on the quality of that work from entomologists of other states. In the forthcoming annual report of the survey for 1885, he will have a paper on the aphidæ of the State, with some original observations and notes on new species. If the Society desire a wide dissemination of these notes among its members and all fruit-growers, it might be well to have them printed in the annual report of this Society. The paper which Mr. Oestlund will present at this meeting of the Society will give some interesting facts on the biology of the aphidæ, the result of his work in the laboratory of the survey.

Now, I have a few reflections, and simple recommendations to make touching the prosecution of this work. It is obviously a *desideratum* with the Society that this investigation continue. It is calculated to give valuable information to the horticulturists of the state. It is at your instance that more elaborate study is given to entomology than heretofore. It is but just, then, that you should share in the cost.

These investigations require time and patience. They can only be carried on by the aid of apparatus for collecting, for examination and preservation. They demand a wide range of reference to books, for comparison and determination of species. As has been said the funds of the survey will not admit of the full equipment of this department. Some examinations have to be delayed, and some have to be omitted entirely, from lack of authorities and descriptions which have before been published. The literature of entomology is very great, and it should be at the command of the student. No scientific investigator will work in the dark, and travel over ground which has been gone over by others. At least he should not be compelled to, when his predecessors' results have all been published for his information.

It is, therefore, in my opinion, not asking too much of you to suggest that you set aside the sum of \$100 for the purchase of some necessary books and pamphlets for the use of the entomologist. These can be added to your Society library, now on deposit at the Agricultural College building, and they would not only increase the value of your collection, but would be accessible to all who desire to study entomology.

I would recommend, further, that renewed effort be made to secure an appropriation by the State Legislature for the necessary expenses of a state entomologist. So long as the entomologist is an attached simply of the laboratory of the geological survey, and cannot devote himself entirely to that science which he is expected to prosecute, all his observations will be fragmentary, his studies will be incomplete, and his conclusions likely to be of less value, if not wholly erroneous. Long continued and uninterrupted observations, throughout a whole summer, or several summers, are necessary to warrant him in giving answers to many of the questions that are presented to him. Through the winter he must study his collections, collate his notes, mount his cabinet specimens and prepare his annual report.

Thanking you for the honor of having served the Society during the year past,

and hoping that you will relieve me by electing some other person for the year to come, and that you will find means to carry out successfully a thorough investigation of the insects of the State.

I am very truly yours,

N. H. WINCHELL.

The following paper was then read:

SOME NOTES ON THE BIOLOGICAL APHIDÆ, OR PLANT LICE.

By O. W. OESTLUND, Minneapolis.

Apparently the plant-lice are among the smallest and most insignificant of the insects injurious to man. In size so small that they are seldom noticed, although to be found on almost every plant if searched for, except when they occur in such great numbers, as they sometimes do, as to completely cover the limb or plant they infest. They lack the firmness of body of most other insects, as only a touch with the finger is usually enough to crush them. But that they in spite of this are capable of inflicting an injury that is often as great as that of other insects apparently more favored, the husbandman very often finds to be the case. What they lack in individual strength they make up by their great number.

Even a century or two ago, when entomology was still in its infancy, a good deal of attention was given to this family of insects on account of their very sudden and numberless increase at times. The family has, therefore, probably given rise to as many discussions and hypothesis as any other in the class of insects, but nevertheless our knowledge of it is very imperfect and too much still remains a puzzle. The life-history, as made out in these early days of entomology has continued to present time with very few changes, and is still found in much of our current literature, although several facts that have more recently been ascertained would call for one more correct. I shall first give you this life-history as usually found, quoting Dr. Thomas from the eighth annual report of the State Entomologist of Illinois, and will then give you in outline the history that I think we are justified to accept in light of what is at present known in regard to these insects. Dr. Thomas says: "In the autumn, as a general and almost universal rule, the last brood, consists of winged specimens, both males and females. These pair, soon after which the male dies; the female deposits her eggs, after which she also dies. Early in the spring, as soon as the sap begins to flow, these eggs hatch, and the young lice at once insert their tiny beaks into the bark or leaf on which they are situated, and begin to pump up the sap. They wander but little, their entire work being devoted to feeding; hence they grow rapidly and soon come to maturity.

"This spring brood consists, generally without an exception, of females without wings. These females, by some strange provision of nature, are capable of reproducing their kind without the intervention of the males, and, instead of depositing eggs, as the last fall brood, are usually viviparous, bringing forth living larvæ.

These are likewise all females, similar to those from which they spring, and they, in turn, produce a similar brood in the same anomalous manner. This process is repeated again and again during the summer and until in the fall, through some six or seven or even more generations. The last fall brood presents a remarkable

change, for it usually consists almost entirely of males and females which acquire wings. These winged females, as previously stated, after pairing, deposit eggs which remain over winter."

In justice to this writer, it is proper here to remark that he gives us this history as generally given and understood, wherefore he also calls our attention to the fact that more careful and recent observations have shown, is in several respects to be incorrect.

One of the greatest objections to this life-history is that the winged females were supposed always to be oviparous. It is now known that they, as a rule, are viviparous, just as the wingless form that first comes in the spring; and that they are not only found in the fall, but more particularly during the summer. The oviparous females of the fall, on the other hand, are now known to be wingless. In pursuance of these and some other facts the life-history will read somewhat different.

SPRING BROOD.

As soon as the leaves begin to make their appearance in spring, the eggs hatch, and the young larvæ are soon ready to insert their beak and begin to pump the sap. This first brood can well be called the spring brood, though the word brood is here used in a more special sense than usual, as strictly the plant lice cannot be considered but one-brooded, and what we here call brood being simply a form; but as the expression is very often used in treating of the plant-lice I find no objection to it, and moreover, as it can not be well misunderstood when used in this connection. All the individuals of this brood are wingless females, which in a few days, being full grown, begin to reproduce their own kind by giving birth to living lice, similar to themselves, and these, in turn, are soon ready to add to the number of the colony. The number produced by each individual for the day varies, but under favorable circumstances there are several, hence the very sudden and great increase that we sometimes observe.

These wingless females show very little desire to wander about, and usually pass their whole life on the same plant. The dispersion of the species is therefore not the object of this brood; their whole life being devoted to the increase of the colony,

SUMMER BROOD

As soon as the warm days of summer have come we find that some of the young lice differ considerable from the parents, especially in the presence of wing-pads and in being more active. These young lice with wing-pads are called pupæ, which, after the last casting of the skin, come forth with full developed wings. In descriptive entomology they are designated as the winged viviparous females, and can also be considered as the second or summer brood. Soon after having acquired wings, these also begin to bring forth living lice in the same manner as the wingless or spring brood, and in this respect do not at all differ from the first brood. But as the colony has by this time so increased in numbers as to make it uncomfortably crowded for these individuals. These winged females soon begin to take to their wings in search for new plants where to establish new colonies. The office of these winged females, therefore, is not only to increase the colony in the same manner as the wingless form, but in addition hereto they have as there duty the dispersion of the species.

That this is the case is of easy observation, especially in regard to many of our garden species, and I need but call your attention to the cabbage or squash aphid, as all who have observed these species probably know that in spring they are found in comparatively few but in very large colonies, and that while one plant may be badly infested, the one next to it may all together be free from the pest, as this first brood seldom does wander from one plant to another. But if we examine the field after the second brood has come to its greatest development, we can usually find not only every plant has almost every leaf with a number of young colonies on them. These young colonies can easily be recognized in that they consist of a winged female with a smaller or greater number of wingless individuals close around her of all sizes and ages. The species inhabiting the squash is especially conspicuous in this respect, as the females usually choose the outer border of the leaf where to establish their colony, and therefore a series of colonies can often be seen encircling the leaf on the under side.

In nature the preservation of a species is always most admirably provided for.

So the plant-lice, that in the wingless form would be incapable to disperse the species successfully, as even a small stream of water would make an effectual barrier, we find that it is most perfectly performed in that some of the viviparous females, in height of the summer, as the most favorable time for flight, acquire wings in order to do this duty.

FALL BROOD.

In the fall quite a different brood makes its appearance, consisting of sexually developed males and females. As before stated, it has usually been considered that all the individuals of this last brood, or fall brood, were winged, it is now known that not only the females, as a rule, are wingless, but that the males are also sometimes wingless. I have observed the oviparous females as wingless in the following genera: Siphonophora, Myzus, Rhopalosiphum, Aphis, Chaitophorus, Lachnus, Callipterus, Mattopoda, Schizaeura and Pemphigus. The only case in which it is positively known that the oviparous females are winged is some of the smaller and lower genera. The largest genus aphid is still clothed in much mystery, the life history of but comparatively few species being well known. Yet all that is at present known goes to show that the oviparous females are wingless.

The occurrence of wingless males has been noticed in several cases, though it is still considered as an open question by some entomologists. We usually do find the males as winged, and the occurrence of wingless can only be considered as an exception, but an exception that is not as rare as generally supposed. In the genus Siphonophora I have observed this form as occurring in several species; usually only as a few individuals, the majority being winged. In one species, belonging to this same genus, all males observed were wingless, not a single winged specimen could be found. This species is found on the wormwood or "sage" (*Artemisia frigida*, Wild.) growing plentifully along the bluffs of the Mississippi in this vicinity, and as it is apparently new to science I have described it as such in the 14th annual report of the Geological and Natural History Survey of Minnesota, naming it *Siphonophora frigida*, as found on this northern variety of wormwood. As I have been able to follow nearly the whole life-history of this species I shall give it as being peculiar in respect to the wingless males, and at the same

time as a recapitulation of the life history of this family as just given. The spring brood consists exclusively of wingless viviparous females that go on increasing the number of the colony in the usual manner. The winged viviparous females of the summer brood were observed during July and August when the dispersion of the species was going on, after which they disappeared and only wingless individuals could again be found. In the fall I expected to find the winged males of the last brood, but after a most diligent search for them during September, October and partly also November, until the cold weather set in, I was unable to find a single specimen. Wingless males were repeatedly observed during this time, though few in number in comparison with the other form. These could easily be recognized as they are somewhat smaller and differ also considerably in color. After a careful study of this form I am convinced that they are normal males, and the only form found in this species. The wingless females of this last brood, after pairing, deposit the eggs on top of the branches ready for hatching as soon as spring again comes around.

HOW WINTER IS PASSED.

How the plant-lice do pass the winter is a question on which there still are different opinions. In regard to most of the species it is still a mystery, as it has been made out in but a comparatively few cases. All those species that are known to deposit their eggs on trees in the fall, there is no doubt of that they do pass the winter in this state. And I do believe that this will be the case with all as they become better known.

Doctor Thomas suggests that some very probably do pass the winter as a demorphised form on the roots of certain plants—dimorphism being known to occur in several species of plant-lice—and that consequently many of those species inhabiting roots will be found to be but a dimorphised form for passing the winter of some aerial species. As Doctor Thomas seems to be pretty well satisfied that this is the case with a large proportion of the pale, cream-colored subterraneous species, it deserves our consideration, but more extensive and thorough study of the subject will be necessary before the question can be set at rest.

The root-inhabiting species that have come under my observation in this locality are yet but few—only three species were found last summer, all of which are without any doubt distinct species as is also apparent from the fact that they are found not only in the fall, but during the height of the summer; and that they occur in different stages of development, as larvæ, pupæ and even acquiring wings while still under ground. The three species observed were: *Aphis middletownii*, Thos., found on the roots of the flea-bane; *Schizoneura panicola*, Thos., found on the roots of several species of grasses; and *Tychea radicola*, Oest., found on the roots of the great rag weed, (*Ambrosia trifida*, L.)

When the full life-history shall have been made out of these subterraneous species we can look for a most interesting and valuable page in regard to this family. With the exception of the well known dimorphised form of the woolly aphid of the apple tree (*Schizoneura lanigera*, Hansen,) the corn plant louse (*Aphis maidis*, Fitch.,) and the grape phylloxera, very little is known at present about this subject.

That inhabiting roots is not the original mode of life in this family, but has been acquired in time I think will be apparent to any one at all familiar with this

subject. Allow me to make a suggestion as to how this mode of life may possibly have been acquired in the family. Ants are known to be very fond of plant-lice on account of the sweet fluid or honey that they emit from the honey-tubes. They are also known to take very good care of them, to protect them from enemies as far as possible, and to remove them to a place of safety if they are much threatened, it is therefore probable that in time the ants also brought them down under ground into their own habitations for protection, and accidentally finding that they could here also have suitable food from the roots of the plants, the first step was taken towards the domestication of the plant-lice by the ants. These domesticated species would necessarily change considerably in time and are now found as distinct, probably making it a very difficult matter to trace them from their original stock. We cannot presume that whole species were transformed into a root inhabiting but a part must have continued as aerial. These subterranean plant-lice would therefore, not be a dimorphised form, but a dimorphised species, if we may use the expression, of some aerial species. But it is not my intention to enter more fully into this subject of dimorphism this evening, how interesting it yet might be. If I can only in some degree call your attention to this subject for future observation by showing that even in this much neglected and little attractive family of plant-lice, we yet have some of the most interesting problems of insect life, enough has been said.

During last fall I had the good fortune to find the eggs of several species that probably will be worthy of mention. Of the highest genus they were observed in three cases.

Siphonophora frigida, Thos.—Found on the ragweed (*Ambrosia trifida*, L.) As only a few eggs were found on any one plant, I am still in some doubt if they are usually deposited on the plant, or in some other place. On dissecting the oviparous form eggs were always found.

Siphonophora frigida, Oest.—This species, as noticed above, deposit the eggs on top of the branches of the plant they inhabit (*Artemisia frigida*, Wild.) When first laid they are soft and pale in color, but soon become hard and shining black on exposure to the air. By the hardening of the viscid substance that covers them at first, they become closely cemented to the plants, where they remain over winter.

Siphonophora adianti, Oest.—A species inhabiting one of the ferns (*Adiantum pedatum*, L.) was observed to deposit the eggs on the under side of the fronds, and as these remain attached to the root-stalk over winter, the young larvæ will have no trouble to find the new growth, which springs from the same root-stalk the following year.

Myzus potentillae, Oest.—A species that is closely related to the currant aphid, also deposit the eggs on the underside of the leaves of the plant on which they live, and as these, like the foregoing, remain over winter, their larvæ are as well provided for.

Aphis mali, Fitch.—The apple tree aphid is well known to deposit the eggs on the trunk and branches of the apple tree. All the trees observed from this locality are well stocked with eggs for next summer. The eggs were mostly deposited during the month of October, though some as late as November. They are of a dirty green color when first laid, but soon become shining black.

The extensive genus *Aphis* has so far given the greatest trouble in tracing the

life-history of the species, and therefore, besides the apple aphid, very little is known how they may pass the winter. If dimorphism will be shown to be one mode it will then mostly be confined in this genus. Most of the species inhabit annual plants, so the apple aphid can hardly be considered as a type for the genus in this respect, being one of the few that inhabit trees. It has even been questioned if the species can be taken as a type for the genus and not be put in some other. The nearest analogy that we have of species living on annual plants are *Siphonophora adianti* and *Mygus potentillae* noticed above.

Lachnus soliticola, Uhler.—This very common and largest of our species is found on several of the willows, and were observed to deposit the eggs very abundantly on the limbs; sometimes a limb being found almost covered by them.

Chaitophorus negundinis, Thos.—Living on the box-elder, deposited their eggs late in the fall in very great numbers on the twigs and limbs, usually choosing the underside of the limb as giving the best protection from the weather.

Chaitophorus spinosus, Oest.

Callipterus discolor, Monell.

These two species, inhabiting the oak, and especially plentiful on the campus of the University, were observed to deposit the eggs in the crevices of the bark. A peculiar fact, probably worthy of mention, is that these as well as all tree-inhabiting species, although they pass their whole life on the leaves, yet never will deposit their eggs on them but always do so only on the trunk or limbs; while on the other hand those that inhabit plants with leaves that remain over winter were found to deposit the eggs on the leaves; this being the case with *Siphonophora frigida*, *Siphonophora adianti* and *Mygus potentilla*. Why this should be so is obvious to every one, and we usually explain it by saying that it is instinct. Very probably it is instinct, but also a good deal of foresight connected with it.

From these, as well as what is known in a few other cases, I think that we have reason to consider the egg-stage as the mode for passing the winter for the family, though more extensive observations are necessary to confirm this.

There are, undoubtedly, still those who would consider it only at a waste of time for an intelligent person to concern himself about how the plant-lice possibly may pass the winter, but I feel confident that I have not such before me this evening and wherefore I will not need to ask excuse for taking up some of your time on this subject. I do not present to you some of the results of my observations, only as a curious fact that may interest you for the moment; not only to show some of the great wonders of nature as found even in these so insignificant beings, not only as a small addition to science, that in no other way can be built up, but by such slow accumulation of fact upon fact, how insignificant they yet may be. There is also an economical side of the question that will deserve your attention as fruit growers of this State, as well as many others in a similar calling. It is very probable that the egg-stage will be the time, when we can best and most successfully destroy this insect—pest of the garden, field and orchard. Too little is as yet known to say much on the subject, but if all-attention be called to it, future observations and experiments are likely to give us some most valuable results.

In conclusion I shall give a short account of a few of those species especially that, concerns the horticulturalist, as found in the orchard, or on the ornamental trees

and shrubs. In the 14th annual report of the Geologist and Natural History Survey of Minnesota I give a list of all the species observed in this locality—some seventy and odd species—to which I refer those who may wish a more extended account.

The species that probably more than any other concerns the horticulturist is the apple-tree aphid (*Aphis mali*, Fitch.) It is found very common in Hennepin and Ramsey counties, and most likely is already found over the whole State wherever the apple is grown. A number of young trees lately set out on the experimental farm of the University were observed to be badly effected. In this case the trees very likely were infested by the aphid, or at least the eggs, before being set out, or they would hardly have occurred in such great numbers as they did, there being no orchard very near. It would therefore be well to have trees inspected before they are set out in a new place where the aphid is not likely to be found before, and if aphid or eggs be found, that they be well cleaned so as to make them exempt from this pest, at least for a year or two, until they can be well rooted and better able to withstand. A young tree on being transplanted has all it can do under ordinary circumstances to accommodate itself to the new locality without having in addition hereto myriads of aphid continually pumping the sap and destroying more or less of the leaves. After a tree has well come under growth it can withstand the presence of aphid as ordinarily found without very much injury, except when circumstances are more favorable for the aphid than the tree, as we some years find to be the case, when even a healthy and well grown tree will become much injured and even succumb.

Together with the apple trees, the mountain ash was also found to be badly affected by the same species of aphid. As far as I am aware, the apple tree aphid has never been recorded as affecting the mountain ash, although we might expect this to be the case from the close botanical relation of the two species.

The species inhabiting the cherry, (*Myzus cerasi*, L.), although not observed in this vicinity, is known to occur in the State. It is very similar to the apple aphid in habits, and often quite as injurious.

A closely related species is the one found on the currant, (*Myzus ribis* L.), observed to be rather common in this county, and to cause a good deal of injury by cupping the leaves, or forming hollows on the under side with corresponding chiefly swellings on the upper side. Leaves so affected turn yellow and fall off before the usual time.

Several of the more favored shade trees are more or less affected by species of aphid. This is particularly the case with the white elm that is affected by two rather common species. One of these, (*Schizonera american*, Reily), gnarling and curling the leaves, making them unsightly and of no use to the tree, and the other species, (*Glyphina compressa*, Koch), forming the cock's-comb galls so often seen on the leaves. Young trees, especially, are often found to be badly affected, and much injured by the combined efforts of the two species.

The boxelder, that is often met with in this county, and seems to be much favored as a shade-tree on account of its rapid growth and fine appearance is also often found badly affected by a leaf-inhabiting species (*Chaitophorus negundinis*, Thos.), and made unsightly by the filthy appearance of the foliage when badly affected. As before stated, the eggs of this species were observed very plentiful last fall, and

if next year should prove to be as favorable to plant-lice as the past we probably will find the species to be greatly on the increase.

The poplars of this locality are also affected by several gall-inhabiting species that not only do great injury to the trees, but also makes them unsightly as shade trees. This is especially the case with the vagabond gall louse (*Pemphigus vagabundus*, Walsh), found not only on the poplar but also on the cottonwood, as large, irregular cocks-comb galls on the ends of the twigs, greatly injuring and deforming the tree by stopping all growth of the twig thus affected. And as the galls remain over winter and turn black, they make the tree quite unsightly after the leaves have fallen. On University Avenue, we have a group of trees that are literally covered with these galls, hardly a twig being found that does not end with one.

Two other species are found to make their galls on the stalk of the leaves, but as these are smaller and fall with the leaves they are less objectionable.

The following paper by R. J. Mendenhall, of Minneapolis, was placed on file:

USEFUL INSECTS.

By R. J. MENDENHALL, Minneapolis.

Mr. President and Horticultural Friends:

In the talks that we have had from year to year on the subject of insects, I have called your attention only to the pernicious caterpillars, worms and grubs from which we, as gardeners and fruit-growers, suffer every year more or less loss. I think now, in justice to the "bug" community, that I ought to say a few words on the other side, and introduce to you, instead of enemies, a few of the more important of our six-legged friends.

When we come to count them up we find that the "good bugs," in point of numbers and value of services rendered, very nearly balance the "bad" ones, and that if the former were all to be suddenly exterminated we should find ourselves, in spite of our "insect powders," "emulsions" and "spraying machines," quite powerless to protect our fruits, flowers and vegetables against the destructive species. Those that I have called "good" are such from a human point of view only, and because they assist man—not by any means, however, from motives of benevolence toward him—in keeping in check the species that do him most damage. By their own kind, there is every reason to believe, they are regarded with terror and abhorrence, as the most ferocious and greedy of murderers and cannibals and very likely they are "out-lawed" by every first-class insect community.

The insects that have proven themselves useful to us in the manner indicated, may be divided into two classes, the predatory or hunting species and the true parasites. In the first class will be found the Tiger beetles, the various ground beetles, the Water-tigers, the larvæ of the Lady birds or Lady bugs, the various sorts of Soldier bugs and the larvæ of the lace wing flies and some few other Nerve-winged species. Most of the true parasites are found among the two-winged or four-winged flies.

The Tiger beetles and Ground beetles are the tigers, leopards, lions and cats of

the insect world. They are as beautiful and as ferocious, in their small way, as are the warm-blooded felines of the African and Asiatic jungles after which they are named.

The Tiger beetles are of medium size, varying in length from one-half to three-fourths of an inch; the form is slender and graceful with the head set on vertically, and the colors are various shades of metallic green or purple, marked and dotted with pale yellow or white. The legs are long and the insects run with surprising rapidity. When pursued they make a series of short, swift flights alighting about every rod. The larvæ are most repulsive looking grubs, having an enormous head and jagged jaws, and the body being furnished with long, sprawling legs and several hooks and horns, by which they sustain themselves in their perpendicular burrows. They live in tunnels from ten to twelve inches deep and about as large around as a common lead pencil and generally bored in hard ground. At the mouth of its tunnel the larva lies in wait for any unsuspecting insect that may happen along, which it seizes in a twinkling and drags to its under-ground den and devours.

The ground beetles (*Carabidæ*) are one of the largest families of the *Coleoptera* and are of many sizes, shapes and colors. Some of the larger species are very beautiful. They are regular hunters, running swiftly over the ground with the head slightly bent, the antennæ projected forward and the sharp jaws apart, and very few insects which they scent escape them. The larvæ are horny, flattened grubs which are as active in burrowing in all directions underground in search of soft bodied grubs and caterpillars, as the perfect insects are in pursuit of their prey on the surface. A very useful species is the Rummaging ground-beetle (*Calosoma Scutator*). This handsome fellow is over an inch long with wing covers of a bright metallic green color, and the head and other parts of the body purple and blue or green with golden reflections. It kills great numbers of the larvæ of the Colorado potato-beetle, the Codling moth and the Curculio before they transform, and its larvæ is just as greedy in devouring the species that have entered the ground.

Another species equally valuable and almost as attractive is the Fiery ground-beetle (*Calosoma calidum*.) This is somewhat smaller than *scutator*, of a black color thickly dotted with large, bright, coppery spots arranged in rows on the wing covers.

A third species, the Elongate ground-beetle (*Pasimachus elongatus*), is of a smooth shining, jet black color, bordered all around with deep blue. This beetle has a very broad head and conspicuous jaws and other mouth parts. The only other member of this group which I shall mention here is the murky ground-beetle (*Harpalus caliginosus*.) This has not so much beauty to commend it to our notice, being entirely of a plain, dull black color, but it has proved itself of service in the exterminating of various leaf-feeders that prey upon our crops.

Everybody knows the trim little Lady birds (*Coccinellidæ*) with their red or orange black-spotted coats. They are of round or oval form, and rather small size, the largest not more than one-third of an inch long. The perfect beetles are sometimes found on flowers, but more frequently on leaves and stems infested with plant-lice or bark-lice which they themselves do not feed upon, but among which they deposit their eggs, and the awkward, ugly larvæ which hatch therefrom very soon dispatch a whole colony of the tender *Aphides* or young *Coccidæ*. There are a great number of species, some of which are very small, only one of which feeds in its larvæ state on vegetation, and that is quite rare.

The Soldier bugs, which we are to consider as friends, are medium sized, shield-shaped, vile-smelling insects, differing from beetles in having the wing covers apparently crossed on the back, with the tips membranous, and instead of jaws they are provided with a strong jointed beak, which they thrust into any soft bodied insect that they come across and suck out its life blood, leaving it when their appetite is satisfied, shrunken and limp, never to recover. *Arma spinosa*, a rather small, dull, green species is one of the principal foes of the Colorado potato beetle, and of some other very injurious grubs and worms. Most of these bugs are dressed in very plain colors, but a few wear bright red or yellow military stripes. These are among the most active and do not need to approach their victims "on the sly."

The Lace wing flies and ant lions are among the few Neuropterous species that do not breed in the water. The perfect flies take but little food, but the larvæ are very voracious. The habits of some forms are very interesting and well repay the observer for the time spent in watching them. Among these is the Ant-lion, an insect resembling a small Dragon-fly but with a slender and rather short body and disproportionately large, floppy wings, which are beautifully spotted but which is does not seem to have sufficient muscular force to manage skillfully. The larvæ are jug-shaped with a horny head and long, sickle-shaped jaws. They are usually found in sandy situations in which with their jaws and strong front legs they scoop out a funnel-formed hollow, hiding themselves at the bottom. If an insect accidentally runs into the open mouth of the funnel it is instantly bewildered and brought down by a shower of sand thrown upon it by the waiting cannibal below, which speedily devours it or such parts of it as may suit its taste. It then arranges its trap for another victim.

The Lace wing flies are beautiful and symmetrical insects with four gauzy iridescent wings and golden and green bodies. The eggs of the genus *chrysopa* are attached to the top of long thread like stalks in the midst, or very near a colony of plant-lice. The larvæ are slenderly oval in form, with strong, thoracic legs and and scissor-like jaws. They are very voracious and destroy incredible numbers of the lice. When full grown they enclose themselves in a dense, white, round or oval cocoon prepared with a lid at one end which is pushed open by the fly in emerging. The larvæ of the genus *Hemerobius* cover their bodies with the skins of their victims.

The plant-lice have still another deadly enemy in the larvæ of various *Syrphus* flies. These are large, flattened, slimy maggots, very disgusting in appearance, but very efficient in clearing the plants on which they are found of the little, vivaporous sap suckers. The flies are usually somewhat longer than the common house-fly; with more slender bodies which are in many species banded with bright colors.

These are all the cannibalistic or predatory insects that I have time to mention at present.

The genuine parasites breed in the bodies of caterpillars and grubs and prevent their development. I have had occasion to call your attention to some of these before, in connection with various leaf-feeding and fruit-feeding pests.

The *Tachina* flies are among the most important of the two-winged parasites. These closely resemble the house-fly in appearance and structure, but are usually larger and have more hairy bodies. They go through their transformations within the body of the host insect, as a rule, but sometimes leave it to enter the ground.

The pupa case consists of the shrunken and hardened skin of the mature larvæ, and the fly issues by a sort of trap door at the upper end. The four winged parasites include a great number of very diverse forms, all bearing more or less resemblance to bees and wasps which are among their near relations. The females are furnished with bristles or horny organs at the tip of the abdomen which are of a great variety of shapes and lengths. These are the oviparitors, by means of which they can place their eggs in the bodies of caterpillars, worms and boring grubs which they cannot closely approach. Some of these flies like the larger *Ichneumonidae*, are so large that a great caterpillar such as the *Polyphemus* or *Cecropia*, or some of the grape vine or tomato vine *Sphinxes*, are only sufficient for food for a single larvæ. Others are so small that a hundred or more will be nourished on the fatty parts of a single worm. Some have oviparitors four or five inches long by which they are able to find the borers in trees and place in their bodies an egg from which hatches a sort of insect cancer for which there is no cure. By some strange instinct these parasitic larvæ avoid the vital parts of their victim which feeds languidly and lives along until its tormenting guests have completed their growth and are ready for transformation.

We have all seen large sphinx worms on the grape or tomato or tobacco whose bodies were covered with tiny white cocoons, like grains of rice set on end, which were still alive though punctured in a hundred places where the little parasites had cut their way out. It is unfortunate that the "first law of nature" enables us to look with satisfaction on such barbaric and pitiless processes, but if insects did not prey upon each other in the ways I have mentioned man would never be able to hold his own against them. The multiplication of the vegetable feeding species is so rapid and excessive on all our most important plants that were it not for the assistance we receive from the small, but not insignificant allies, whose vigilance far surpasses our own, they would soon take complete possession of our fields and orchards and leave us penniless and disheartened.

It is most desirable that all should learn to distinguish the beneficial from the injurious species, that the former may be exempted from the death sentence which we are very apt to execute without any form of trial, and in so doing often destroy a friend instead of a foe. This is a branch of economic entomology that should receive especial attention at our agricultural colleges and at all meetings that have for their object the promotion of practical agricultural science.

BLACKBERRY CULTURE.

On motion of Mr. Cutler, Mr. C. H. Hamilton was requested to give the Society some of the results of his experience in blackberry culture.

Mr. Hamilton. Mr. President, I did not come here with any intentions of making a speech, and I hardly know now where to begin on this blackberry question. I will state to you, in the first place, that we are quite extensively engaged in cultivating blackberries; also other small fruits, but we are making a speciality of blackberries.

I think it was about eight years ago there was some three acres

planted at our place. Those of us that were beginning in the business were cautioned by some of the older ones to move cautiously, that it wouldn't be but a year or two before the blackberry business would be overdone. Well, we have progressed along, as fast as we could get the plants, and at the present time there are about seventy-five acres planted inside the city limits of Ripon; we claim that we have had success, and it has been obtained by means of thorough cultivation, care and protection.

Some people ask me if the variety known as the Ancient Briton is hardy and will endure our winters. I tell them it will, and that it is as hardy as any known variety, to my knowledge. Again, they say, "The idea of laying them down is a great expense, so much so that it takes off all the profit." That is a greater bugbear in the eye than it is when you come to go to work at it and try it. The expense of laying down an acre of blackberries I am not at present prepared to give, but I can take a five acre patch, and give you some idea of the expense connected with its cultivation. In removing the old brush, laying the plants down, and covering for winter, the expense on five acres was thirty-six dollars; the further care of them, raising them up in the spring, and preparing them for fruiting, the expense would be about twenty more, making about fifty dollars to insure a crop on five acres for the next year. In the last seventeen years that I have known this variety to be cultivated in that way, I haven't known it to fail. I claim that an outlay of fifty dollars on five acres of ground insures me a crop of one thousand dollars worth of fruit. This can be substantiated by my salesbook.

The fruit of this variety is one of the best for shipping I have ever seen; it is a large, firm fruit. Mr. Tuttle has extended an invitation to send two or three men over to our place to look at our mode of cultivating and our different patches of berries, and we shall be glad to meet any persons that you may see fit to send there, and we guarantee that we will show them as fine fields of blackberries as they can find anywhere.

A Member. What distance apart do you set the canes?

Mr. Hamilton. We plant in rows, seven feet apart, three feet in the row; occasionally some eight feet by three feet; some plant eight feet by four feet. A trellis is placed on each side, and the wires and stakes are about twenty feet apart.

A Member. What is your mode of cultivating?

Mr. Hamilton. It is to keep the ground as rich as we possibly can.

We mulch for winter, drawing the mulch out in the summer and working it into the soil for the purpose of keeping the ground rich. We cultivate about in the same manner as you would a piece of corn; giving thorough cultivation, but not deep.

A Member. What is the character of the soil?

Mr. Hamilton. We have a variety of soil at Ripon. We can furnish a black loam, prairie soil, underlaid with clay subsoil; then we have a sandy clay soil and loam; we also have almost clear sand. They are a little earlier on the sandy soil than on the prairie, but as to the difference, whether they do better in one place than in the other, you can't tell it by the eye.

A Member. Do you prune any?

Mr. Hamilton. Yes, sir, we pinch them back to about three feet and three and a half feet high. That causes them to branch out. Some of them undertook to trim the laterals, but we found that we were cutting off the part where our best fruit grew. We now take off nothing but the top.

A Member. Is the Ancient Briton as hardy as the Stone's Hardy?

Mr. Hamilton. I consider it is fully as hardy.

A Member. Are they thorny?

Mr. Hamilton. They are a thorny bush.

A Member. How many canes do you allow in a hill?

Mr. Hamilton. Not over five; you will not very often find that many.

Mr. Smith. How do you cover them?

Mr. Hamilton. They are covered by removing the dirt at the side that you wish to lay the brush over. Then place your foot at the crown of the fork and push it under the root and bend down; you bend the root by so doing, and not the top. Lay them down straight, as the row extends; we endeavor to cover them from the side. I think it is better to have the rows run north and south, because after they have been laid down, the dirt being again removed, the canes will run in the angle on which they were laid down; the new growth will be in full foliage and that breaks the heat from the midday sun on the berries. You have all observed that the best wild blackberries we get are those that have been raised in the shade.

Mr. Cutler. I would like to ask whether you turn them north or south?

Mr. Hamilton. We bend them to the north; that is the way they run. We endeavor to have the rows run the way that they would

be most likely to carry off the water. If it is on a sidehill and the slope is to the south, we should have the rows run north and south, so that when the plants are covered it will make a ridge, and the water which is apt to collect between the rows will flow through them. Water is detrimental to the plants. We cover with dirt.

Mr. Pearce. Do you cover the vine entirely up?

Mr. Hamilton. Yes, sir.

Mr. Pearce. Is it necessary to do it?

Mr. Hamilton. In our locality, some claim it is not; but when we have no snow, I do not consider it safe not to fully cover. It is not the cold weather that kills the cane so much as the freezing and thawing, and we think we have too good a thing to run any risk, when it only costs from six to eight dollars an acre to insure their coming through the winter in excellent condition.

Mr. Pearce. Did you ever try putting only sufficient dirt on the canes to hold them down?

Mr. Hamilton. Only along the side of fences where snow gathered in. It isn't safe to leave them uncovered except where snow is likely to collect.

A Member. You said you mulched, what time?

Mr. Hamilton. We draw it in the winter, and leave it in heaps there; after we have raised our plants and hoed them out, we put this straw or mulch around them and then do our cultivating afterwards.

A Member. What slope do you consider the best adapted for blackberries?

Mr. Hamilton. I consider a south slope the best. I should prefer a level piece, but not what you might call a low piece.

Mr. Underwood. Will you allow me to add a word in connection with what you said of covering. A gentleman from Dakota who is growing some berries, was at my place this fall and telling me how he covered his vines, and I practiced it a little. He has a man go along with mittens on, who straddles the row and lays the plants down while another man follows and puts on some earth to hold the canes down; when he has that done, he hitches a horse to a plow and throws up a furrow, covering the canes. He covered some grape vines in the same way.

Mr. Hamilton. That it is an easy and quick way of doing it, and you will get through the first winter, likely, all right, but it is hard governing the plow, and you will break and loosen a quantity of roots; then it is necessary to keep one man in there the rest of the season to

keep the sprouts down, while you will find that you have broken the roots from the main vines and checked them. I undertook to cultivate them in that way, but I soon found it was really costing me more, and I took to laying them down with a spade, wholly.

Mr. Underwood. You take the dirt out on the north side so as to lay them down toward the north?

Mr. Hamilton. Yes, sir; my rows run north and south, and I take out the dirt on the north side so as to lay them down toward the north.

Mr. Underwood. I think that is a very important item; if it isn't going to do to plow with a horse and cover them in that way, we ought to know it.

A Member. How high will they grow?

Mr. Hamilton. They will grow from eight to twelve feet high; but we endeavor to keep them back to three and a half or four feet; we keep them in hills and keep down all sprouts.

A Member. What price do you get, wholesale, for the berries?

Mr. Hamilton. My berries this year were sold at \$1.60 a case.

Mr. Smith. Ten cents a box; about two thousand cases for the five acres.

A Member. I understand you cultivate with the hoe?

Mr. Hamilton. Between the rows we do all the cultivating with a horse; we do not cultivate very deep, using a common corn cultivator.

A Member. Do you give them any support, after planting?

Mr. Hamilton. Not the first season; but the second year we support the canes with wires on each side. If there is nothing to protect them from the wind, it will soon break them over, and they will be sprawling all over the ground.

A Member. How high is that wire?

Mr. Hamilton. About two feet and a half. We put one wire on each side, and the stakes are about twenty feet apart.

Mr. Smith. In regard to mulching, did you state the material that you used?

Mr. Hamilton. I have mulched with almost every variety of straw and hay—anything that I could get.

A Member. How much mulch do you use?

Mr. Hamilton. You can't use very much if you cultivate. There is no need of cultivating from six to eight inches on each side of the row. Hardly any plants or weeds will grow under there, on account of the shade.

A Member. Do you fasten your vines by those wires in any way?

Mr. Hamilton. Well, occasionally we cross-tie them.

A Member. Please tell us what you know of the history of the Ancient Briton.

Mr. Hamilton. As far as I have been able to trace the history of it, it was originally sent from Wales, to a county in Southern Wisconsin about twenty-two years ago. A man in Berlin, Wis., first got hold of a few plants and set them out, and he came through Ripon, the first I heard of him, seventeen years ago this coming spring. I bought a few plants of him, and also a few of my neighbors. I was not in the fruit business then, I was running a general nursery. My neighbors planted them out; they did not protect them and they said they didn't think it was of any use to try to raise blackberries there. One fall I was unloading a hay-rack, and a row of blackberries were near, and as they hadn't borne, we expected to dig them up in the spring, and the men put this hay-rack on them; they were thus laid down under the hay-rack. The next spring these canes were alive and the rest of the row killed. That suggested to me the idea of covering and the question why not lay down the blackberry as well as the raspberry? I undertook the task of laying them down. And that was followed up by different persons in the vicinity of Ripon, until now, blackberry culture is one of the chief industries of our town. There are about seventy acres, as I said, in cultivation in that vicinity now.

A Member. How far from the ground do you place those wires?

Mr. Hamilton. About two feet. I had five acres of blackberries last year; I took 725 bushels off the five acres; on one acre it was the seventh crop.

A Member. Will they run out in the course of ten or twelve years?

Mr. Hamilton. There are plants in Ripon that have borne the fifteenth crop, and are still in good condition; I have seen them eighteen years old.

A Member. They stand it better than red raspberries then?

Mr. Hamilton. Yes, sir.

A Member. Does any insect trouble your blackberries?

Mr. Hamilton. I have never seen anything on the Ancient Briton; I have noticed that the Stone's Hardy was affected in some cases.

A Member. Don't you consider the Stone's Hardy a better berry than the Ancient Briton?

Mr. Hamilton. No, sir. I claim I can send the Briton blackberry to Minneapolis in better order than you can the Stone's Hardy, half a mile distant from your market.

A Member. Doesn't your Stone's Hardy continue longer in bearing than the Ancient Briton?

Mr. Hamilton. No, sir, I think not.

The following paper was placed on file for publication :

A COMPLETE FARMER'S GARDEN,

By JOHN S. HARRIS, La Crescent.

Mr. President and Members of the Minnesota State Horticultural Society:—

Our motto is good fruits of all varieties in abundance for all purposes; an abundance of fresh vegetables upon our tables every day in the year; lovely flowers to shed their fragrance over the pathway of life.

While I acknowledge that I am by nature a farmer and in experience and education a life long gardener, I am convinced that some one has made a mistake in designating me to present to this meeting a paper upon the subject of a Complete Farmer's Garden. I consider it in many respects the most important subject that will engage the attention of our Society, and worthy of being presented by some one more able than myself to make it interesting. It would be a simple matter to tell you what kind of gardens very many of our Minnesota farmers have, but a laborious and tedious task to map out and describe in detail such a garden as every farmer ought to possess who has cast his lot in this so-called "Farmer's Paradise," famous the world over as the beautiful land of "Golden Sheaves" and "Laughing Waters." When we look about us and consider the short period of time that has elapsed since our State was the hunting ground of the savage and the almost boundless pasture of the bison, where the tread of civilization had never encroached, and the hum of business had never been heard, we are led to exclaim, "wonderful marvel of the age." Within half a lifetime it has become dotted with towns and villages, and threaded with railroads and a trail of gold is following back upon each track and being switched off at every station, a tribute from the older "East" and "South" to the excellence of our "No. 1 hard," "sleek Shorthorns," and the prize "butter and cheese" of America. We have scores of farmers who take commendable pride in breeding good blooded horses, and without being jockeys they are compelled to take the dust from the best of any other state. We have hundreds of stockmen engaged in rearing the best cattle, sheep and swine that has ever found its way into any market. We have everything produced within our borders that is needed to get up the grandest exposition and fair, the eye of man ever beheld, and do not fear to come into competition with the world. What more do our farmers need, what greater boon can they ask? I reply, thousands of them need better homes, not merely a place to shelter their families, but true homes. The farm is the plant that creates or furnishes the life, wealth and power of the world, and the farmer is the commissary who opens up the storehouses of the soil, and gives out the bread to feed the teeming millions of the earth; therefore he is entitled to a home worthy the name. Now, my idea of a true farmer's home is as many broad, fertile acres as can be well tilled without making his life a burden and the life of his wife and children a hateful drudgery; good substantial buildings,

outwardly neat, and corresponding to the demands of the family, and located upon the pleasantest spot on the farm. Within, they should be convenient and supplied with the arrangements for lightening the labor of the housekeeper, and should contain ample comfort for the physical man, and for the inner man, pleasant pictures hanging upon the wall, good books and papers upon the table as a provision for mental improvement, and as a change, music is refreshing to the tired body after the rough and heavy work of the day is ended. There should be kept upon the farm the best of stock and that well cared for. The field fences and out buildings should present nothing unattractive about them but should harmonize with the dwelling. Upon the "ideal farm" there is no place for unsightly hedge rows of brambles and thistles along the fences or wood piles, worn out tools, broken down sleds and wagons and other rubbish in the street. Stumps and boulders have been removed from the highway, and rows of trees adorn its sides and in summer cast their refreshing shade upon the traveler, and in winter loosen the icy grip of the fierce blizzards. The dwelling stands well back from the road and in front is the well kept lawn, with here and there an evergreen or ornamental tree to break the monotony, and the walks from the road to the house are bordered with flowers, a reminder to the passing traveler that hospitality, comfort and happiness have a dwelling place within. The ideal home is a pattern after nature. Nature delights in beauty; she loves to brighten the landscape and make it agreeable to the eye. She hangs the Ivy round the ruin, and over the stump of the withered tree twines the graceful vine, and clothes even the Alpine heights with moss and lichens.

The farmer's occupation brings him into constant association with nature, and it is his privilege to draw inspiration from her handiwork.

Is that all that is necessary to make the farmer's home complete? Where is the orchard and the garden? What kind of a home is that which is barren of fruits, vegetables and flowers? Mr. President, do you think there are any such in Minnesota? How many farmers do any of you gentlemen know that furnish their tables with two or three quarts of fresh fruit every day from the time the first strawberries are ripe until the last cluster of grapes is clipped from the vine, and canned fruits for every remaining day of the year? How many farmer's gardens do you know of that are ample in size and furnish his family with all the fresh vegetables they can consume from the first sallads in spring until the cellar is stored for winter? What an improvement it would be, and what enjoyment it would give to take an acre or two out of that field that runs right up to the door, and transform it into a productive fruit and vegetable garden, and make it the most pleasant and profitable acre upon the farm. Even farmers want something more than to merely exist. Any good fruit and vegetable garden is worth more to the family than the products of any ten acres in wheat. Pork and beans, potatoes and bread, although they will sustain life, leave a void that can only be satisfied with the luxurious and wholesome products of the garden. In my opinion the farmer who does not plant a good plat of ground to small fruits and vegetables is not enjoying the advantages that God designed he should, neither is he dealing rightously by those committed to his charge. Why does he not do it? He says because he has no time to fool with such little things. Little things they may seem now, but when the end cometh, when his overworked wife has laid down the burden of life and rests in yonder cemetery, and his children have flown the parental

roof to find more congenial homes, and he finds himself a prematurely old man in the world, a sad picture to contemplate, he may look back upon the neglected little things with deep regret.

The complete farmer's garden should conform in style and character to the homestead and its surroundings, and in size to the wants of the family. It should be located in the immediate vicinity of the house, so that it may be readily accessible and under the constant supervision of the household. It should be located if possible, so as not to take away from the cheerful aspect of the homestead, but rather to add to its charms. If a portion of it is devoted to the cultivation of flowers, that should, if possible, be so located that the passing neighbor and stranger may enjoy its beauty and fragrance. Flowers are like pure breezes and sunlight, we enjoy them none the less because others enjoy them too. Another reason why it should be located near the house is that a great many leisure moments may be utilized in weeding and taking care of it, besides the saving of time in going a long distance to gather its products as they are wanted for daily use.

Some judgment should be exercised in choosing the soil for the garden. A decidedly gravely or sandy soil is unsuitable for general garden purposes, and so is a heavy tenacious clay soil. The very best soil is a sandy, deep, rich loam that will work easily and dry off quickly after a rain, and yet retain sufficient moisture to withstand considerable of a drouth. For this northern climate it is better for having a southern exposure sloping a little to the east and south. Almost all vegetables and most of the fruits do better upon land that is sloping enough to give good surface drainage, say about one foot to thirty. It should be securely enclosed so that neither stock, poultry or dogs can enter it at will. It would be better if the north and west sides were protected from chilling and tempestuous winds, either by a tight board fence or a live hedge. A high bluff, grove of timber or orchard on the north side affords good protection, but as farm buildings are often erected without regard to the garden it cannot always be located on the most suitable spot. Another important requisite for the garden, is to bring it into a high state of cultivation and fertility by deep plowing and the liberal application of manures. For the present purpose, as but few of our farmers will care to make a separate plot for each, we will make it a combination fruit and vegetable garden. Having selected, manured and fenced a spot for a garden, the next question that arises is, what shall we plant and how shall we manage to gain the best results at the least possible expense of time and labor. If it contained one or more acres of ground, I would recommend devoting one-third to one-half to permanent plantations of summer fruits, chiefly strawberries, raspberries, currants and grapes, and an asparagus bed, pieplant patch, etc. To facilitate cultivation I should plant every thing that will do as well in long rows instead of square plats, so that a horse may be used to help in the work. I should lay off a border upon the north side and the two ends, or all around, from twelve to sixteen or more feet wide, to be used chiefly for the permanent plantations of fruits and perennial plants, leaving a four foot walk inside to separate it from the remainder, and for convenience in using a wheelbarrow, turning the horse in cultivation, etc. In making the permanent plantation, commence on the north border, at the end nearest the house.

First, leave room for hot beds and cold-frames; next a little plat for early lettuce,

radishes and pot herbs, then let enough roots of rhubarb or pieplant to furnish material for sauce and pies before the early fruits are ready. The remainder of the north border may be set to grape vines, three or four feet from the fence and six to eight feet apart, and if a wide border and two rows are planted have the rows ten or twelve feet apart. If this space holds more grapes than is desired, a portion of it may be used for an asparagus bed or strawberries. The east and west border had best be used for strawberries, currants, etc. Upon the south border set two or more rows of raspberries, set the first row three or four feet from the fence, the second six or seven feet from that. Commence at one end and set both rows with blackcaps, as many as are desired three or four feet apart in the row, then set the remainder of the patch with red varieties three feet apart and keep them in hills, or if it is thought desirable to try a few blackberries, and I think it is, let them have thirty or forty feet at one end of the border. The reason for this is that a row of blackberries along side of the others would prove troublesome on account of their thorny habit and propensity to spread and run out everything else. If this border takes more of the above varieties of fruit than is desired, a portion of it may be planted to currants. Upon one of the end borders set as many currant bushes as will produce what fruit the family will require; they should stand four feet apart in the rows, rows six or seven feet apart. Of the remainder make an asparagus bed, or if other provision has been made for asparagus and currants, turn it into a strawberry bed. The other end border has been designed for strawberries, but if it is not needed for that use it may be used for a flower garden. Upon the border devoted to strawberries, set one-half this spring and plant the remainder to potatoes or some other hoed crop and the next spring set to strawberries. If it should be desirable to take two crops of berries from the same plantation before turning them under make provision for a third plantation to be set the third spring. This disposes of the borders and provides a quantity of fruit, shrubbery and vines that if properly managed will produce all the summer fruit that a large family can consume in the fresh state, and afford a supply for canning, drying and preserving for winter use.

A bed of asparagus unless it has already been provided for will finish the permanent plantation. It may be a single row upon either side of the garden, and four or six feet from any row already planted or in a plat of any shape, but the rows had better run in the same direction with our rows of vegetables to facilitate cultivation and avoid tramping or turning a horse when plowing or cultivating. This plant delights in a rich, warm soil, and pays well for good cultivation and liberal manuring. Once established it will annually throw up its abundance of rich, healthful food, through all our and our children's lifetime. The remainder of our garden plat is designed for the growing of culinary vegetables, and may be arranged to suit the different plantings, and planted in varieties and quantities to suit the wants of the family. The fitting of the ground can be mostly done with the farm team, plow and harrow, and the plowing may be done in strips just as wanted for planting, but I consider it the best to all be plowed as early as the soil is free from frost and in good condition to work well. If weeds should get started on any portion of it before needed for the later plantings, they can be pretty thoroughly destroyed by an extra harrowing, or it may be plowed again.

To insure the best results each species or variety of vegetable seeds should be

planted in their appropriate season. Peas, onions, beets, radishes and lettuce are rarely injured by spring frosts, and for the earliest crop should be planted as soon as the ground is in condition to work well. Onions for the main crop will also do better if sowed early, and a few early potatoes should be planted at the same time, but we expect the farmer to raise his main crop of potatoes in some other field. It is useless to plant the seeds of beans, sweet corn, cucumbers, melons, tomatoes, etc., in the open ground before the first week in May, or until the ground becomes somewhat warm and dry. A great many kinds of vegetables may be brought to maturity earlier if started in hot beds or cold frames, and transplanted into the open ground afterward.

The time allotted me will not admit a description of the making and management of hot beds and cold frames. Beets, carrots, parsnips and salsify or vegetable oyster usually do the best to be got in early in May. All root crops are the best in rows sixteen to twenty-four inches apart. Everything that comes up too thickly must be thinned to give the plants room for perfect development. It is better to have all vegetables in rows too close to admit of the use of a horse in their cultivation planted upon one side of the garden, and it is not essential that the rows of these should run the whole length, but they may be divided off into plots with narrow walks between each variety; neither is it essential that the rows of anything run the entire length of the garden if they are planted to such varieties as will admit of cultivating at the same time, and require the same distance between the rows. Cabbage and cauliflower may usually be transplanted for the early crop as soon as the plants can be gotten ready. It is useless to transplant tomatoes, egg plant and peppers before the latter part of May. Celery is not usually planted before the first of July. Of lettuce, radishes, snap beans and sweet corn it is best to make several plantings at intervals of two or three weeks, to keep up a succession until frost comes.

A garden line should be used in planting everything, and great pains taken that rows may be equally distant apart and perfectly straight. It might not produce a better quality or greater quantity of vegetables for taking these pains, but if our newly planted garden looks well, we will feel a greater interest in it than we would in a slouchily arranged truck patch, and as one thing after another begins to come up in clean straight rows, we will begin to feel proud of our accomplishment, and the whole family, even to the hired man, will become interested and willing to lend us a helping hand to keep it a thing of beauty. They will probably call it "our garden," and try very hard to make it the best one in the neighborhood, and perhaps it will stimulate our neighbors who see it to go and do likewise. This paper is very far from complete, but owing to its great length I must bring it to a close. To secure a better knowledge of the varieties of fruits and vegetables and methods of cultivation, I can only recommend my hearers to join the State Horticultural Society, and become active members. The complete "farmer's garden" is a "comfort and joy" to its owner. It is a prize that is not beyond the reach of every farmer in the State. It cannot be brought about at once. It may require years to do it. By doing a little at a time, adding one improvement after another, every farmer may create around him scenes whose beauty alone would amply reward him for all his labor. A garden thus formed by degrees is much more satisfactory than one produced at once by a great outlay of labor and money, because the pleasure of

creating was prolonged. In this way too, new fruits, flowers and vegetables may be added from time to time, each giving new pleasure and new beauty. The farmer needs recreation, and where can he find it better than in his garden? Time spent there will make him fonder of home and keep him from temptation, and as the love of home increases, he will surround it with associations of beauty, and memories of joy and pleasure will go with his children where'er they roam. And when his "last debt is paid," and his neighbors stand around his new made grave, they can truly say: "His work is done; he did it well, and there is one little spot of earth that is better for his having lived upon it."

On motion the meeting then adjourned until Friday morning.

MORNING SESSION.

FOURTH DAY, FRIDAY, JANUARY 22, 1886.

The meeting was called to order at 9 o'clock, Friday morning, by President Smith.

REPORTS FROM EXPERIMENTAL STATIONS.

It was announced that the first thing in order would be the reports from Experimental Stations.

The resolutions offered by Col. J. H. Stevens, on Wednesday, relative to a Committee on Seedlings, etc., were, on motion, unanimously adopted. (See page 174.)

Prof. E. D. Porter and P. M. Gideon not being present, M. Pearce, of Minneapolis, was first called upon for a report.

REPORT OF MR. PEARCE.

Mr. Pearce. Mr. President, I was not aware that I was down for a report, but I can report verbally as to what I am doing. A great many cions have been sent to me and I have grafted them and given them a trial. They were pretty much all root grafts, and came from different places, some from New York state and some from other distant points. Think there were fully fifty different varieties received, and all have been put out, staked and properly marked. A great many of the grafts came through last winter without any injury particularly, but some of them will die. I think some of them will be valuable; especially one or two kinds received from northern Nebraska. They don't appear to be injured at all.

A number who were expected to report at this time, not being present, N. J. Stubbs, of Long Lake, of the General Fruit Committee, was called upon for a report.

REPORT OF MR. STUBBS.

Mr. Stubbs. Mr. President, I have a few remarks written out here but the subject has been so thoroughly canvassed heretofore that it will, in a great measure, be a repetition of what has already been stated.

President Smith. It may be similar to reports from other districts, but that is to be expected.

Mr. Stubbs then came forward and presented a written report. This was a well arranged and somewhat lengthy paper, containing many valuable suggestions. It was, however, accidentally misplaced by Mr. Stubbs, and at his request is omitted here.

During the reading of the paper some discussion was had. Mr. Stubbs stated in reference to grapes, that his Delawares did not ripen well two years ago owing to the cold and backward summer season. He said he had experimented with a variety of currants that were supposed to be Stewart's Seedlings.

Mr. Pearce inquired if they were not the same as the Victoria.

Mr. Stubbs replied that he thought not, as he was well acquainted with Mr. Stewart, and thought he would not send out varieties not true to name.

President Smith. I have them growing on my place and think well of them.

Col. Stevens. It is not to be presumed that Mr. Stewart would put anything on the market that was not genuine, and claim that it was the same as the variety that he had been experimenting with for years, for he had a reputation for honesty and fair-dealing.

Mr. Pearce. I have heard many speak of this variety who pronounce it the Victoria.

Col. Stevens. I don't suppose there are half a dozen persons in the State that have it.

Mr. Elliot. There have been very few of them distributed.

Mr. Smith. There is a marked difference in the appearance of the bushes, more perhaps than in that of the fruit.

Mr. Stubbs stated that he had planted Fay's Prolific, but it had not yet fruited. They seemed to be very promising but he did not expect them to prove as valuable as they were recommended. He believed the Em-

pire State variety of grapes, for this locality, ahead of almost anything else, on account of earliness. It has not been known to be attacked by disease, even when planted by other varieties that were diseased; in this respect it is like the wild grape. It is a vigorous grower, being a cross between the Clinton and Hartford Prolific. It will be extensively cultivated, especially in this country where we have a comparatively rigorous climate.

He had raised Downing's gooseberries, which had fruited abundantly, and considered it the best variety, although the past season it had developed some mildew.

Mr. Underwood. I have tried Downing's two or three times, but with me it freezes out badly. It is rather a spraggly grower, does not look like the Houghton, the American, or Smith's, is a more thorny and an open grower.

Mr. Smith. About four-fifths of the bushes sold for Downing's are Americans.

Mr. Stubbs. The Downing shows a good many limbs coming from the ground and the berry is large and handsome.

Mr. Elliot. The Downing that I have is heavier in thorn and limb than either of the other kinds that have been named, is an upright grower and has given me no trouble with winter-killing.

The name of William McHenry, of St. Charles, being called, the assistant secretary said that it was stated by Mr. McHenry, in a letter, submitting a paper to be read at the meeting, that the Russian Mulberry was a humbug.

The following report was then read:

REPORT OF O. M. LORD.

MINNESOTA CITY, January 15, 1886.

To the State Horticultural Society:—

In attempting to report progress from one of the experiment stations, I am reminded of the criticisms on the management of the University farm. The critics are like the boy who desired to see a miracle by planting a pomegranite seed and immediately plucking the fruit. They would ignore entirely the element of time. A chemical experiment may show its result in an hour or a minute and be satisfactory, but the most trifling experiment in agriculture requires at least a year, and in horticulture who shall say how many years? Our beginning was small, and at the end of two years there is little to report except growth and a few additions. The object of the Society in appointing stations was to secure reliable information for the benefit of the people at large, in regard to the cultivation of fruits. In order to secure a variety of soils, and climatic and other natural conditions for experi-

menting, these stations have been as widely separated as possible, and probably have been wisely chosen. The exact location, the particular character of soil, altitude, exposure, etc., should be made a matter of record with the Society for reference.

A general uniformity of selection and distribution of trees and plants among the Stations should be made, to insure reliable knowledge as to their adaptability or desirability for general cultivation. No uniform plan of work has been devised or at least no instruction to that effect has been given. It is supposed that each experimenter has done what he could in his own way. As individuals we are apt to run to specialties, and if we succeed we are liable to jump at conclusions. It is under such circumstances that trees and plants are sometimes largely advertised and sold, that prove to be entirely unfit for general cultivation. I commend the spirit of the nurseryman who stated in his catalogue, that the Hansell raspberry was not adapted to sandy soil. It saved me some money and useless work and probably greater disappointment. If I had been informed in the same manner of the Reliance, and numerous varieties of strawberries, I could have saved myself a good deal of expense and labor. It is hoped that the Horticultural Society through these Stations will secure sufficient tests to enable anyone to plant with a reasonable assurance of success.

The grounds selected for the experimenting here are near the railroad station, upon what is known as table land, lying about thirty feet above the Mississippi river, and nearly level, with exposure about equal. It has been under cultivation twenty-five years. The soil is sandy to the depth of two feet, and underlaid by a foot or more of yellow clay, and then loose gravel. It has never suffered with drouth and the natural drainage is such that it does not suffer with wet. For experiment, and otherwise there are now growing thirty varieties of apple trees; twenty varieties of plum trees; twelve Osheim cherry trees; eight varieties of strawberries; two of blackberries; three of red raspberries; and the Gregg black; of grapes, the Concord, Delaware and Lindsey; native plums have been and will continue to be a speciality.

FRUIT REPORT FROM O. M. LORD.

MINNESOTA CITY, January 18, 1886.

So far as I can learn, old apple trees are dead, with the exception of the Duchess and the crabs. A large number of young trees have been set, and to all appearances are doing well.

There is considerable increased interest shown in the cultivation of the small fruits; no doubt induced by the failure of apples. The local markets were well supplied with Duchess, Transparent and Hyslop. Strawberries were abundant and prices very low. Currants were scarce. There was a fair supply of raspberries, blackberries and grapes. The indications are that a good many fruit trees will be set the coming season. The Russian varieties are attracting more than usual attention.

Mr. Harris. Mr. President, Mr. Lord wrote me a few days ago that he had found that it was disputed by some that he was the manager of

an experimental station, although he was appointed at our annual meeting two years ago.

President Smith. I remember that Mr. Lord was appointed at that time but I see that his name does not appear in the list.

Mr. Harris. It was an oversight that his name was not published, and I move that his name be properly placed among the names of the managers of Experimental Stations.

The motion was adopted.

Mr. Underwood being called upon for a report said: Mr. President I am not prepared with a written report. If you would just duplicate the very excellent report of Mr. Lord, which has just been read, in case it were found necessary to do so to fill out our proceedings with something of the kind, I think it would very accurately express what I would wish to say. It seems to fit our experience almost exactly. I don't know, if I were to write out a report, that I could improve upon what has been expressed in giving his experience. We have suffered much from the severe winter and there was no way to avoid it, and all we could do was to take it as it came. Even many of the shade trees, Maples, Elms, etc., were more or less injured. The effects of the winter have not in all instances been entirely disastrous, still, more or less injury was done.

Mr. L. E. Day, of Farmington, being called upon for a report, said: Mr. President, I have very little to report. I have just commenced, you know, in a small way, and as yet have only a few cions, but the most of those put in are doing nicely. I am succeeding well, so far as I have gone. Have not done enough as yet to make a report upon, but have done the best I could with what I have had.

REPORT OF J. S. HARRIS.

LA CRESCENT, JAN. 1, 1886.

Mr. President:—I have very little to report in addition to what was brought out in the discussions at our last annual meeting. I have accepted the position of manager of an Experimental Station in good faith, and shall prosecute the work as extensively and rapidly as circumstances will permit. To start with I have but little besides the ground on which to make a beginning. Some cions were furnished me in the spring of 1884, by our former secretary, Mr. Gibbs, including two varieties of apple, two of plums, and one of cherry. I did not succeed in making any of the cherry cions grow. The apple cions lived and made a fair growth the first year, but unfortunately they were worked upon tender stocks, and last winter made a finish of them. Some of the plums are living. I procured and planted a few Cuthbert raspberries and Ancient Briton blackberry plants, both of which are

promising well. The raspberries bore a fair crop of very fine fruit last season. The canes seem to be as hardy as any variety I have tested except the Turner, and the fruit is large and of fine appearance, and will take well in the market. The fruit of the blackberry is superior in quality to the Snyder or Stone's Hardy, but ordinarily they will require winter protection. I also set a few young trees of the Rollingsstone plums donated by O. M. Lord of Minnesota City, and a half dozen of the Pheeney plum procured from E. Markle of La Crosse, Wis., and Moors Arctic from E. Wilcox, La Crosse. The Moors Arctic is a variety of tame plum that is reported as hardy in the State of Maine. The others are natives that have a good local reputation. The natives are doing well, and I hope to have some fruit from them the coming season, and as I have the De Soto I shall be able to compare them together and determine their relative merits. The Moors Arctic lived and made a fair growth the first season, but one of them was entirely killed last winter, and the other considerably injured, but may recover to produce some fruit. They were worked upon native stocks by budding about one foot above the ground, and did not seem to have formed a very perfect union. I think they would do better as root grafts. Last spring I made some additions to the planting, setting a few trees of the Giant Swaar, Rollins Pippin, Wabasha, Red and Yellow Anis, and McMahon White, procured from A. W. Sias of Rochester, and about sixty trees in thirteen varieties of Russians and a few pears, procured of Prof. Budd of Ames, Iowa. These trees were called two-year olds; they were small and inferior looking compared with American varieties of the same age, and some of them appear to be very slow growers and may require nursing an ordinary lifetime before they will be much trees. I think they would do better if grafted upon stocks from Russian seeds. Most of them were secured under numbers instead of names. I set them in my best garden soil, and they generally have made but little growth, and some of them blighted badly. Three varieties, the Antonouka, Anis and No. 4 made a good growth and look well. I also planted three small one-year old trees of the Salome, all looking well. I received some cions of the Brett Seedling from Mr. Sias, and have succeeded in saving enough to get a start. I find that although hardy, the Orange and Strawberry crabs do not make good stocks for working by cleft grafting owing, to a wind in the grain of the wood that prevents their splitting freely. In grapes I have set two vines of Niagara and one of Empire State. They have made a fair growth. I also planted two each of Early Cluster and Wilson June blackberry, and have a few one-year seedling apples that I shall hold for trial.

The following report was next read:

Mr. Sias. I will say that I have put upon trial everything that has been sent to me. Even varieties that I had tested years ago and had found to be worthless, I have experimented with them. A large number of cions sent me by a friend from Maine two years ago made a good growth the first year, but they were not hardy enough for last winter. My report may have very much of a sameness about it, but here is the result:

REPORT OF A. W. SIAS.

ROCHESTER, MINN., JAN. 16, 1886.

Mr. President and Fellow Members:

Spring of 1884, grafted 11 trees with Pewaukee cions, on Hybrids, all dead.

" " " " 4 " " Spitzenburg cions, on Hybrids, all dead.

" " " " 2 " " Wrights Sweet cions, on Hybrids, all dead.

" " " " 2 " " Yellow Bellflower cions, on Hybrids, all dead.

" " " " 2 " " King of Tompkins County cions, on Hy-

brids, all dead.

Spring of 1884, grafted 3 trees with Wolf River, on Pippin, all dead.

" " " " 7 N. W. Greening, on Hybrid, one living.

" " " " 4 Robinsons Seedling, on Hybrid, all dead.

" " " " 7 Robertsons Red Everlasting on Gen. Grant Crab, all dead.

" " " " 4 Oxford Russet Everlasting, on Hybrid, all dead.

" " " " 3 Roxbury Russet Everlasting, on Hybrid, all dead.

" " " " 5 Vaughn Apple, on Hybrid, all dead.

" " " " 6 trees Forster's Red Winter, on Hybrid, all dead.

" " " " 4 cions trees Forster's Sweet, on Hybrid, all dead.

" " " " 4 cions trees White Astrachan, on Hybrid, all dead.

" " " April 3d, grafted, 5 cions trees, Ostheim Cherry grafted on small red wild cherry, all dead.

Spring of 1884, grafted 4 cions trees Red Plum, on wild stock, all dead.

" " " 4 cions German Rambo, all dead.

1884, 2 Coles Quince, grafted on Hybrid, all dead.

" 2 Clark Apple, grafted on Hybrid, all dead.

" 3 Porter Apple, grafted on Hybrid, all dead.

" 4 Golden Russet, grafted on Hybrid, all dead.

" 3 Dean Apple, grafted on Hybrid, all dead.

" 4 pair Eastern Belle, on Hybrid, all dead.

" 2 Red Astrachan, grafted on Hybrid, all dead.

" 2 Baldwin on Duchess, all dead.

" 4 Bangor Apple on Crabs, all dead.

" 2 High Top Sweeting on Hybrids, all dead.

" 4 Hovey Apple, on Hybrids, all dead.

" 5 Seeknofurther, on Hybrids, all dead.

" 2 Northern Spy, on Hybrids, all dead.

" 16 trees Longfield, on Hybrids, all dead.

" 2 Messenger Russet on Duchess and Minn. Crab, living.

" 12 trees Brett Seedlings on Hybrid (stocks not all hardy) 4 living.

" 2 cions Lieby on Hybrids, all living.

" 1 cion Charlamoff, on Hybrids, all living.

" 2 Hiberna, on Hybrids, all living.

" 2 Ostrekoff's Glass, on Hybrids, all living.

Ostheim Cherry trees received from Chas. Luedloff of Carver, doing finely.

REPORT OF M. C. BUNNELL, NEWPORT.

Mr. Bunnell, of Newport, being called upon, said: Mr. President, I have no written report. I find the Duchess and Wealthy are badly injured from the effects of last winter. As regards the Hybrids, I think Whitney No. 20, as a general thing withstood the test very well. Those having Transcendents seem inclined to think well of them, as they bore well; Hyslops did not stand quite so well. As regards plums, the De Soto more particularly gives good satisfaction. Weaver has not come into bearing much in my district. Think both varieties will stand the climate well here. As regards grapes, the Concord and Delaware seem to be the leading grapes and have done very well. The raspberries raised in our section are mostly the Turner and Philadelphia of the red kinds, although some are planting the Cuthbert. It is thought by some, however, to be too tender, that it needs protection through the winter. Of blackberries Stone's Hardy stands at the head of the list, with Snyder next. These varieties seem to be giving very fair satisfaction.

As regards strawberries the Crescent and Wilson seem to take the lead for productiveness and hardiness. There are some other varieties that are being planted there, such as the Ironclad, etc. Bidwell has been planted some but I don't think it will amount to much on our light soil; I don't know what it might do on clay soil. The Windsor Chief may perhaps give very good satisfaction. There are some other varieties of course that are being tested, but I find that in Dakota county the majority of the strawberry growers seem inclined to plant the Wilson, more particularly I suppose on account of their shipping qualities. The Crescent will yield greater crops perhaps than most any other variety we can plant.

Mr. Elliot here announced that a meeting of the Amber Cane Association was being held at the Nicollet House.

As some of the members present desired to attend the meeting of the Amber Cane Association it was suggested that the reading of the paper by Mr. Kellogg be deferred until afternoon.

Mr. Jenkins. I am not one of the fruit committee although I am very generally known among fruit raisers in the northern part of this county and in Anoka county. I am not in the tree growing business although I see a good many. As far as my experience goes I would say from what I have seen that trees were injured some last winter, a year ago; still in my section they have borne a good crop of apples.

I am on the prairie, but near the big timber in the northern part of this county. Those who are raising grapes have had good crops of fruit. The raspberry crop was very good and the strawberry crop was most excellent. The varieties most grown there are the Wilson, Crescent and Countess. The latter variety has done exceedingly well. My own seedlings you all know about and I do not need to mention them.

Mr. Cutler. I made a report as Vice President. I don't think it is necessary to make any further report.

The Secretary then read the following:

REPORT FROM CLARENCE WEDGE, ALBERT LEA.

The blight entered my orchard three years ago and after disposing of the Hyslops and greatly injuring the Transcendents it last season affected every variety in my orchard, the Wealthy and the Maiden Blush seriously, the Duchess, Tetofsky and Elgin Beauty, the Whitney and Briar Sweet slightly. The Wealthy has in some cases thrown up strong suckers, and I am now in doubt whether to save them or grub up the old trees and plant anew.

The Duchess lost the greater share of its fruit buds by the winter, but saved enough to produce a good crop. Rollins Pippin winter-killed outright, while the Elgin Beauty by its side came out fresh and resisted the blight, which I consider a good showing for this variety, considering that it was set the season before and on account of poor roots was barely able to live through the summer.

Through the kindness of Prof. Budd I was able last spring to set out a little orchard of yearling Russian apples and pears, and a few willows and poplars. The apples made a strong and the pears a feeble growth. The willows and poplars were very distinct and interesting. *Salix Laurifolia* is certainly as beautiful as a willow can be, its leaves having a thick glossy polish resembling a heavy coat of varnish.

My vineyard has been the most satisfactory part of my fruit garden, beginning with a half dozen vines cared for in a most ignorant and unsystematic manner, it has ever proven a most reliable and bountiful source of fruit, and such fruit too as made us the envy of our neighbors. I have fruited the Concord and Delaware five years with but one failure and that but partial. The Agawam, Massasoit, Champion and Cottage as two-year old vines bore a few branches last season. The Telegraph and Prentiss although rank growers have failed to ripen any wood for two years and a large share of the vines are dead. For our latitude a variety equal to the Concord and ripening a little earlier I should consider about perfect. The Cottage promises to be of about this description; it certainly is of a much more vigorous habit than the Worden or Moore's Early and I think it may deserve more attention than it is receiving at the hands of the planters of this State.

The De Soto plum is a favorite with us, it is abundantly fruitful and its season being later than that of our wild plum, the time of sitting under our own plum tree is very pleasantly prolonged.

In this stony country the most important horticultural work that our farmers can engage in, is that of planting belts of evergreens that shall fully protect their houses, barns and barn yards; the cottonwoods, willows, etc., commonly planted are a partial protection, but it should be constantly insisted upon that they are not sufficient, and that evergreens are not difficult or slow to grow when properly managed. This is a work that all can engage in with enthusiasm no matter how sordid or unrefined their taste. We bank up our houses and shut them in with storm windows and storm doors, let us also cast up this outer breastwork of green and smile when the storm king rages.

I cannot bring this report to a close without expressing some of that gratitude, which as farmers of this State, we owe to those few brave and enthusiastic men who, overwhelmed by discouragements again and again, have yet led on to the present advanced state of horticulture; what other men of our time have bestowed such comforts on posterity? How might these interests have languished and our homes been left without many of their attractions and endearments!

There is now no room for despair, everything leads on to the hope that this land which already flows with "milk and honey" may indeed "blossom as the rose."

REPORT OF G. W. FULLER, LITCHFIELD.

Mr. Fuller. As a member of the fruit committee I have prepared no written report. In that already submitted I said nothing about plums. The De Soto bore last year and promises to be valuable. The Weaver variety, which was set some four or five years ago, has not borne any as yet. The crop of native plums was very good.

As far as the experimental station is concerned, would say that I have had very few cions sent to me as yet. Have been unfortunate somehow. A bunch of cions sent to me from some source proved a failure. The Russian varieties killed down a trifle but they grew nicely last season and appear to be doing finely. Four varieties were sent me by the Secretary. In the spring I intend making a careful examination and will make a definite report. I cannot report definitely on the varieties received from Prof. Budd.

Mr. Harris. Mr. President, there was no member on the General Fruit Committee from our county to report, and I will merely state that last winter killed the trees very badly, everything excepting the Duchess, Tetofsky and Peach apple. Now, while the Peach apple is the hardest variety I have upon my place I don't recommend it to people for general cultivation. Not because it is not an ironclad, but it is not productive and it seems to be more infested with this destructive insect known as the circulio, than almost any other variety. It seems to be a favorite variety with them. One of my trees had perhaps a barrel of apples but I could hardly find enough perfect speci-

mens for a single plate and I did not exhibit any of the fruit at the Fair as I intended to do. The list of apples that we recommend down there for cultivation is the Duchess of Oldenburg and Wealthy; and for trial, the Duchess of Oldenburg.

REPORT OF F. J. SCHREIBER, MOORHEAD.

Mr. Schreiber, of Moorhead, was requested to make a verbal report.

Mr. Schreiber. Mr. President, I would say that in our cold section of Minnesota there are quite a number of amateurs trying to raise fruit, but thus far the prospects are not very good. I have never received any cions but we are working and experimenting right along. One of my neighbors located near the Red River in a little timber belt has made a partial success with a small orchard of Transcendents.

President Smith. Have you an orchard or are you engaged principally in growing small fruits?

Mr. Schreiber. I have a little of everything; but you know I am located on the open prairie about three miles southeast of Moorhead. I have several thousand trees all told, including evergreens and fruit trees. My trees exist but I cannot say that they are very healthy, at least not so thrifty as I would like to see them. The Transcendent seems to be about the only variety of apple grown to any extent, and that only along the river where there is shelter; some two or three orchards there are doing very well. Mr. Probstfield, an old settler, has an orchard of bearing trees, mostly Transcendents. He has experimented with the "Ironclads" but says there is hardly anything as hardy as that variety, and they are dying off gradually. The Black Walnut is raised there. One of my neighbors has some hard Maples which are doing well. He is also making a partial success with hardy, Russian apples. The orchard is three or four years old but not yet in bearing.

Mr. Underwood. Have you the Russian Mulberry and is it hardy?

Mr. Schreiber. I have a thousand small trees from six to ten inches high. They stood well last winter. I lost very few trees but they were killed back some.

President Smith. How are small fruits, strawberries, etc., doing?

Mr. Schrieber. Quite well. There is an abundance of wild strawberries on the praries. I think all that went into raising small fruits have been making a success of it. Cultivated strawberries are doing well. Evergreens do well; I have several thousand trees. The White Cedar is doing well.

Mr. Cutler. About what growth does the White Cedar make?

Mr. Schreiber. It makes a very good growth.

Mr. Busse. Do you raise any raspberries up there?

Mr. Schreiber. Yes, mostly the blackcaps. I could not tell which varieties do the best, the red or the black. They lay the canes down and some cover with corn-stalks; others cover with earth. As a rule all fruits do better in the timber than on the prairie. Where corn-stalks are used for protection on the prairie there is this objection that the snow drifts, and in the spring when it melts there is too much water on the surface; consequently we suffer more from the water in the spring than from the cold in the winter. In the spring the nights are generally cold and the snow which melts in the day time causes the water to accumulate and it remains for some time on the level prairie, doing much harm to trees and plants.

Mr. Busse. What is the soil up there, generally?

Mr. Schreiber. A stiff clay.

Col. Stevens. It is a black, deep, rich muck, with a hard, clay sub-soil; probably the richest soil this side of the West Indies.

Mr. Kellogg. How are you succeeding with the hard maple?

Mr. Schreiber. One of my neighbors, Mr. Brendermuhle, is growing it successfully. The trees are quite young. We are also growing the White Ash.

Col. Stevens. I would state that many years ago where the village of Casselton now stands, in Cass county, Dakota, on what was then called "Goose Creek," I planted out a good many bushels of acorns and a great many seeds of different kinds of trees. And to my certain knowledge the trees did well there. I did not personally attend to them but Mr. Elliot's gardener attended to them for me. Among the kinds of trees that succeed well in that neighborhood were the box-elder, elm and cottonwood. Of the latter there are some trees there now which I am told are as large around as a man's body, but of course they were planted a long while ago.

Mr. Schreiber. I would state here that I think we should not get our trees too far south as our northern grown trees succeed best. I got a car load of white willows from Illinois eight years ago and planted them on the open prairie there, and I find that they do not thrive, whereas the same variety planted from stock received farther north has proved to be a rapid grower.

REPORT OF R. M. PROBSTFIELD.

The following letter and report of R. M. Probstfield, was then read:

MOORHEAD, CLAY Co., MINN., January, 16, 1886,

S. D. Hillman, Sec'y. Minnesota State Horticultural Society:—

Dear Sir:—Your note of January 9th received. Should have replied at once but for the hope that I would be able to attend the winter meeting of the Society, next week. I am now convinced to my regret that I will not be able to do so. It is a great disappointment to me. As I cannot be with you in the body, I will all the same be with you in sympathy and spirit, and hope for a session abounding in success, profit and pleasure to all attendants, the whole State, and in particular for the good old wheelhorses of the Society who have contributed so much, to make the Society and its meetings a blessing to the Northwestern states.

Very truly and sincerely yours,

R. M. PROBSTFIELD.

REPORT OF SUPERINTENDENT OF EXPERIMENTAL STATION.

By R. M. PROBSTFIELD, Moorhead.

I have very little to report on. First, I would mention that on March 16, last, I received from A. W. Sias of Rochester, the following cions: two Kimball, two McMahon White, two Autumn Streaked and four Hart. On May 12th they were grafted on as thrifty and sound appearing Transcendent stock (top graft) as I possessed, (had no other). I gave half of the cions to Chas. Brendermuhle of Kragness, of Clay Co. Of mine, not one bud started. Brendermuehle reports the same failure. I have been thinking that the cions were damaged during the time of transmission by mail, which was during a very cold and severe spell of weather. Two of the cions looked very bad and shriveled when received, the balance appeared all right. They were kept in a cool cellar in a small box filled with earth, tops of cions about three to four inches out of ground.

I wish to amend my report of date April 9, 1885, somewhat. (Page 296 of Report.)

The Wealthy which I found at that date to have been damaged most, improved wonderfully during the season and got into fair shape for this winter, yet I have no hopes for its hardiness in this region, and would advise experiments on only a very limited scale. Whitney No. 20 is not altogether hardy here, but have still some hopes for it; would advise experimenting with only a few. Beach's Sweet and Sylvan Sweet seem entirely recovered from last winter's damage and I feel encouraged to continue to try them. Transcendent is the only real iron-clad I have tried, but is subject to blight of late years.

Red and white Dutch currants, hardy as the oak here, and good bearers; have no other on trial. Turner's seedling raspberries, which I wintered for the first time last winter was but little injured, without any covering and no snow. The wild raspberry, indigenous here is perfectly hardy, bears well and furnishes a good supply for home use nearly every year.

Blackberries froze completely out last winter, despite the covering of about three inches of soil over the bent vines. Houghton's seedling gooseberry froze badly last winter; no crop of them this year, but they stood the winters fairly well before last winter.

Strawberries froze out completely where not covered last winter; where covered, they came out all right, but crop very poor on account of hot, dry winds at the critical time when beginning to set fruit. Has been so with me for the last three seasons.

As I was very well aware the Society was not in the possession of funds to supply experimental stations with stock to experiment on, I made an effort on a small scale to try some on my own account and applied to Mr. A. W. Sias of Rochester, Minn., for ten kinds of his hardiest varieties of apples, using his own judgment in the selection thereof. After receiving the trees from Mr. Sias, I applied to Mr. A. G. Tuttle of Baraboo, Wis., to supply me with a number of varieties other than those furnished by Mr. Sias, also to make his own selection with the request to consider hardiness above quality. I will here offer my thanks to those gentlemen for the furnishing of those selections at prices which probably will not pay for the work of handling them, showing thereby their earnest striving for progress by experiments in the cause of pomology, in regions heretofore supposed to have been too rigorous a climate to grow apples.

The following is the list of trees furnished by Mr. Sias:

Two Red Anis, No. 985; one each of Early Champagne, 68; Russian Green, 382; Autumn Streaked, 964; Longfield, 161; Somerville Seedling; Red Black, 966; Yellow Transparent, 334; McMahon White Seedling; Red Transparent, 333; Yellow Anisette, 987; Revel Pear, 338.

From Mr. A. G. Tuttle, two each of the following: Yellow Anis, Long Arcade, Glass Winter, Hibernial, Blue Anis, Whitney No. 20, Arabian, Green Streaked, and Enormous.

I shall try to add a few more to this list if I can obtain them, and if any members of the Society, or new members attending, have anything as hardy or harder not contained in this list, I would like to correspond with them. I should like to try about twelve or fifteen varieties more, if there are that many in existence to-day with any reasonable show of being hardy enough for this climate.

I had intended to apply to Professor Porter of the University for some, but was told that there were no trees to spare for a year or so. I should be glad if anyone could inform me where I can inquire with a reasonable prospect of obtaining a few more hardy varieties not contained in the list given.

President Smith here announced that a number of papers on the program for the afternoon would be read at this time.

The Assistant Secretary then read the following paper:

FRUIT FOR FARMERS FAMILIES.

By O. M. LORD, Minnesota City.

With most farmers, where you have discussed apples, the subject of fruit is exhausted. The cultivation of small fruit is supposed to demand more labor and

skill than they possess, or can command; nearly all, in opening their farms, have set apple trees and some have tried the smaller fruits, but success has not been general. One of the common mistakes has been in the selection of varieties, another has been in starting upon too small a scale. A dozen plants only have been purchased; when the quantity should have been at least a hundred. The smaller quantity is put in some out of the way place and neglected, when a larger number would have received proper attention. If a small quantity of plants is set in some out of the way place, it requires hand labor to care for them, which is always the most expensive and hard to command of any on the farm. Hand labor is really the great bugbear of small fruit raising. If farmers could be convinced that a good supply of small fruits could be raised, with no more work than should be given to a crop of corn or potatoes, many a family would enjoy a plenty that now rarely see any upon their tables. With such as do not like fruit, I have no argument. I have never seen a child who did not like it, nor a woman, nor a man whose taste was not perverted. It is not claimed that we can grow all kinds of fruit in Minnesota, profitably, but it has been demonstrated that we can successfully raise apples, plums, grapes, strawberries, raspberries and blackberries when our climatic conditions are well understood; and when varieties and methods of cultivation are carefully considered our success is reasonably certain.

I shall not attempt to discuss with farmers, the preparation of the soil for fruit raising, the authorities all agree upon that part of the subject. In regard to adaptation of different varieties, to the various soils, too little is generally known. It is, however, well understood that for climatic reasons we cannot depend upon the old standard varieties of apples of the eastern or middle states and that there are kinds that succeed here, no well informed person will dispute. The plums, commonly cultivated at the east and south have not succeeded here, and there are natives indigenous here that compare favorably in quality with any of them, and in character of tree, hardiness, productiveness, and ease of propagation far surpass them. No farmer need be without this very desirable fruit, as this is its natural home, and it is adapted to any variety of soil found here, and to almost any kind of treatment as to cultivation. D. B. Wier, a prominent fruit grower, says he has solved the problem of producing native plums in any quantity, viz: to plant different kinds close together (mainly for fertilization) from four to six feet in rows, twelve feet apart. An indiscriminate selection of trees from the woods is not desirable, a better way is to plant the seed from such as are satisfactory, and continuously select the best; or if a superior kind can be found to propagate by grafting. Experiments have proved that it pays to give the trees of any variety thorough cultivation. They may produce a single crop or more, while standing in the grass, but they will not continue to bear and do well in that condition.

STRAWBERRIES.

Not one farmer in ten is supplied with strawberries of his own growing.

So much has been published in regard to this fruit, that little remains to be said, although its habits of growth, and the methods of cultivation are so well known, failures in the production of fruit are common. Beginners are confused with the numerous kinds advertised, and make mistakes with the varieties in regard to fertilization and adaptability to different soils.

The average farmer cannot afford to experiment, and is easily discouraged with one failure. For such, a few varieties only can be named that are entirely reliable.

The Wilson for clay ground, Downers Prolific for sandy soil, and the Crescent seedling with a fertilizer for either soil, will with proper care, well repay one for time and labor. In order to reduce the labor, I mean hand labor, to the lowest point, this and all other small fruit should as far as possible be placed upon clean ground, in rows of such length that the cultivation can be mainly done with a horse. Rows of ten rods in length are short enough to be conveniently managed. If every farmer would set apart half an acre to be devoted to small fruit, and plant so as to be easily cultivated, the fruit return would pay him a hundred fold besides enhancing the value of his farm in the opinion of any intelligent buyer.

RASPBERRIES.

Raspberries follow strawberries in season, and there is no small fruit grown more easily than the red varieties. After the first year of planting the amount of work given them does not necessarily involve more than is usually given the same quantity of corn or potatoes, and a selection of two or three kinds will prolong the season, till blackberries are ripe. Plants set ten years ago of the Philadelphia and Turner have produced nine good crops, some very large yields, and are still in good condition, without any hand labor except trimming out and picking; the cultivation being done with a horse and small plow or cultivator. Some growers practice trimming in the fall, and laying the canes down, and with a team and large plow turning backfurrows over the rows, claiming that they are thus certain not to be injured by the cold. Others do not disturb the bushes in the fall after picking the fruit, claiming that the surplus bush retains the snow, and thus enable them to endure the cold without damage. The Wisconsin growers pinch back the growing canes to make them branch out, but it is doubtful if this method is beneficial after the first year of growth, with any of the red varieties, while it is absolutely necessary with the black ones to secure large yields. The black varieties were abundant in the market at Winona a few years since. The kinds were Mammoth Cluster, Seneca, Miami, Davison Thornless, and Doolittle; mostly the latter. There are at present some of the Gregg, a disease having attacked the others and nearly or quite destroyed them. The disease was not the well known rust or yellows, but the tender shoots had the appearance of being stung with an insect which killed them. No known black variety will stand our winters as will the red ones, but if it is desirable to try them, the Doolittle is probably the most reliable for hardiness and quantity of fruit.

BLACKBERRIES.

Very few farmers have tried to raise blackberries; where they have tried, they have succeeded beyond their expectations. In addition to the cost of cultivating, they need to be protected in winter. The cultivation does not require much hand labor. The method of protection for winter in a great measure fills the place of hoeing, etc. Farther south it is advised to sow clover between the rows; cutting it and using as a mulch between the hills. That plan is not practicable here. Shallow plowing, turning the furrows to the rows and then from them to keep the surface level and the weeds and suckers down, is the cheapest and easiest way to cultivate them. Large stout canes that have been pinched back will produce the most fruit.

If too many canes are allowed to grow in a hill, they will be so slender as to fall down, making them difficult to cultivate and protect. The season of this fruit may be greatly prolonged by setting early and late varieties. There are no varieties adapted to a wet soil. A clay loam will produce the most fruit, but they will ripen earlier where the soil is sandy.

Besides the foregoing fruits, others might be named, which would well repay the farmer for all necessary cost and labor, but those named including currants involve the least outlay in money for plants and will yield a bounteous return for the labor bestowed.

FRUIT AT NEW ORLEANS EXPOSITION.

Mr. Woolsey. Mr. President, I would like to inquire, if it is in order, if it would not be right to ask some explanation from Mr. Gould in regard to our fruit exhibited at the New Orleans Exposition last winter, as to whether we had received an adequate return for the large amount of money expended in making that exhibit.

President Smith. It is not on the program but I think everyone would be glad to have a short report on that subject.

Mr. Gould. *Mr. President and Gentlemen:*

I would like to add somewhat to the report that I have already made which is published in the proceedings for 1885. At the time I prepared my report I was not well and I made it as short as I could and omitted some things of some interest to the people of the State. I know that many are in the dark in regard to some things which were left out of the report.

Mr. Gould here read extracts from the published report referred to. Continuing, Mr. Gould said: The arrangement was that fruit had to be in place on the night of the 14th day of January, as the tables would only hold a certain amount; they were calculated for twenty thousand plates. Mr. Parker Earle, of Cobden, Ill., was superintendent of the horticultural department. I had seen him frequently previous to this time and consulted with him in regard to space in Horticultural Hall, and he informed me that I could have all the space on his tables that I would agree to fill. But I will say here that Mr. Gibbs, the Commissioner from Minnesota, was in favor of making the principal display of fruits in the Government Building, which was three-quarters of a mile from Horticultural Hall, and hence there was no chance for an exhibition for competitive prizes in the Government Building. All fruit that was to compete for prizes had to be exhibited in Horticultural Hall. I was in favor of making our principal exhibit

there, but Mr. Gibbs was in authority and preferred to have it made in the Government Building with the balance of the State exhibits, for the purpose of making a very creditable exhibit there, thinking perhaps that it would be of more value to the State to put it up in that way than it would be to compete for prizes at Horticultural Hall. As far as I am concerned I have no opinion to express in regard to that policy at present. It was my wish at the time to make an exhibit of fruit at Horticultural Hall because I wanted to make a show of our fruit. And I will say here that we had very much the best exhibit of Russian apples there; in fact there was nothing of any consequence from any other state in the line of Russian apples. I had about five bushels, comprising eight or ten different varieties.

Mr. Harris. I would like to inquire whether we did not have a sufficient quantity of fruit to make a creditable exhibit in both departments if it had been put up?

Mr. Gould. I had fruit enough to make an exhibit in both places. I could have made a good exhibit in the Government Building and could have used six or eight varieties there without interfering with the exhibit in Horticultural Hall. There was another thing in the way. Everything was behind except in Mr. Earle's department. He had his building and tables ready for fruit the first thing in the Exposition. The official opening was on the 14th day of December and he asked to have some fruit placed there from our State. Only a small portion of the states had their fruits on hand at that time. It was talked up among the commissioners generally that they would not put any up there then. He came down and made a special request that we should take some fruits up there and I thought it was very important to do it, but I was only one. It was the understanding, however, among all the commissioners at that time, with one or two exceptions, that he should not have much fruit.

Our structure in the Government Building was not completed until about the 13th of January, so that we could begin setting up fruit there. On the morning of the 14th, when there was no more time to spare, if we made any exhibit in Horticultural Hall—we had to do it that day—I got Mr. Woolsey, who is now present here, to assist me in taking some grapes up there and getting that exhibit arranged. The committee came around once or twice to ask us whether we had things arranged. The next day, when it was too late, I asked the privilege of taking a few apples up there to see if I could not get them on the tables. Mr. Gibbs was then entirely willing that I should do

so, and I took up a few specimens in a common market basket, carrying them up on my arm, and succeeded in getting two premiums on that lot.

Mr. Harris. Are we to understand that that was all the apples that we had there of our immense collection that came in competition with those of Wisconsin and other states?

Mr. Gould. Yes, sir, that is all; it was either four or five varieties.

Mr. Hoag. I would like to know how our fruits compared with the fruits of Iowa and Wisconsin.

Mr. Gould. Well, there are some testimonials here that I might read which were given by strangers of their own free will who saw our exhibit.

I will say that Ohio brought down some of their Catawba grapes, expecting, of course, to carry off the prize, for they are supposed to be the Catawba people of all the rest of the country. They had some in nice condition; they were almost perfect; the stems were yet green and the grapes well preserved. But those exhibited by Minnesota were the best. The management there are still owing the State Horticultural Society ninety-five dollars in cash for premiums awarded. It is doubtful whether the debt is worth anything. They owe us some medals which they will give us if we will make them. But in this respect we have fared the same as the people from other States. I presume foreign premiums have been awarded, but I do not know. Ohio tried hard to secure that prize, but there was no question that Minnesota had the best. One gentleman of forty years' experience in fruit-growing in New York came to me and inquired if our grapes were grown in the open air. He thought they must have been grown under glass; but they were all grown out doors. Kansas exhibited some seventy varieties, but they did not succeed in preserving them to exhibit them in a presentable condition. I had some photographs taken of our exhibit. I have one left which the Society can keep if desired.

Mr. Harris. What about our exhibit of Minnesota wine?

Mr. Gould. I don't know whether that was entered for competition or not; I was not there.

Mr. Harris. It is suggested by Mr. Kellogg that perhaps the judges drank the wine and forgot to make a report.

Mr. Gould. I think it was used up after I came away. I noticed that apples from different parts of the country varied much in form and color; the apples that were grown on the Pacific coast, especially those from California, seemed to take on an elongated habit. The

Baldwin runs out long and pointed. They have a nice, waxy look. I believe the finest apples I saw were grown in Oregon and Idaho—the largest and finest looking. There was a collection of over one hundred varieties of apples from England, and they had a sort of famished appearance, as if they were starved, the sides being pinched in back of the calyx. I should therefore conclude that England is a poor place to grow apples, and not as good an apple growing country as our own.

On motion a vote of thank was tendered Mr. and Mrs. Gould and Miss Gould for the manner in which they had cared for the fruit exhibit at the Exposition.

AWARD OF PREMIUMS.

Mr. Hoag, from the Committee on Award of Premiums, presented a report which was, on motion, adopted:

We, the members of the Committee on Awards, have discharged our duty to the best of our ability, and report the following:

APPLES.

	PREMIUM.	AM'T.
Display Wealthy, Andrew Peterson, Waconia, - - -	First	\$5 00
Winter Apples, Andrew Peterson, Waconia, - - -	First	2 00
Winter Apples, Willow Twig, Talmon Sweet, Fameuse, Ben Davis, Sweet Seedling, Geo. J. Kellogg, Janesville, Wis.,	Special	5 00

GRAPES.

	PREMIUM.	AM'T.
Best plate, A. W. Latham, Excelsior, - - - - -	First	\$5 00
Best plate, A. W. Latham, Excelsior, - - - - -	Second	3 00
Best plate, Iona, Andrew Peterson, Waconia,	Third	2 00

VEGETABLES.

	PREMIUM.	AM'T.
Best Display, Wm. Lyons, Minneapolis, - - - - -	First	\$5 00
Best Display, H. F. Busse, Minneapolis, - - - - -	Second	3 00
Winter and Spring Potatoes, Beauty of Hebron, J. J. Cale, Minnetonka, - - - - -	First	2 00
Winter and Spring potatoes, Burbank, J. J. Cale, Minnetonka,	Second	1 00
Early potatoes, Ohio, Wm. Lyons, Minneapolis, - - -	First	2 00
Early potatoes, Ohio, J. J. Cale, Minnetonka, - - -	Second	1 00
Onions, Wm. Lyons, Minneapolis, - - - - -	First	2 00
Onions, Wethersfield, J. J. Cale, Minnetonka, - - -	Second	1 00
Beets, Wm. Lyons, Minneapolis, - - - - -	First	1 00
Beets, Basona, G. H. Roberts, Minneapolis, - - -	Second	50
Orange carrots, G. H. Roberts, Minneapolis, - - -	First	1 00
Orange carrots, H. F. Busse, Minneapolis, - - -	Second	50
Parsnips, G. H. Roberts, Minneapolis, - - - - -	First	1 00
Parsnips, Wm. Lyons, Minneapolis, - - - - -	Second	50
Hubbard squash, H. F. Busse, Minneapolis, - - -	First	1 00

PANTRY STORES.

	PREMIUM.	AM'T.
Best display canned fruit, William Lyons, Minneapolis, -	First	\$3 00
Best display canned fruit, E. M. Chandler, Minnehaha, - -	Second	2 00
Display Jellies, W. H. Brimhall, St. Paul, - - - -	First	2 00
Display Jellies, Wm. Lyons, Minneapolis, - - - -	Second	1 00
Mixed Pickles, W. H. Brimhall, St. Paul, - - - -	First	1 00
Mixed Pickles, William Lyons, Minneapolis, - - - -	Second	50
Home-made maple vinegar, Knight H. Whipple, Northome, -	First	1 00
Home-made maple vinegar, J. J. Cale, Minnetonka, - -	Second	50
Dried apple sauce, Mrs. M. A. Pearce, Minneapolis, - -	Special	1 00

WORKS OF ART.

	PREMIUM.	AM'T.
Collection Paintings, Mrs. J. T. Grimes, - - - -	First	1 00
Seedling strawberry, J. W. Jenkins, Champlin, - -	Special	\$2 00
Gregg Raspberries, J. W. Jenkins, Champlin, - - -	Special	1 00
Currants two varieties, J. W. Jenkins, Champlin, - -	Special	1 00

We recommend a special premium of five dollars on collection of apples entered by Geo. J. Kellogg, of Wisconsin.

Also, special premiums as indicated in report. (Signed)

M. J. HOAG,
W. E. BRIMHALL,
F. G. GOULD,

Committee.

CRANBERRY CULTURE.

Mr. Tuttle. Mr. President, I would like to speak of one kind of fruit that has not thus far been mentioned. I understand there are facilities for growing it somewhat extensively in Minnesota. I refer to cranberries. It is not really necessary that a man should have a marsh in order to grow cranberries; if you have a flat, or level piece of sandy land, so situated that you can keep the ground moist by allowing a stream of water to flow over it, enough to moisten the soil, you can grow cranberries with success. Some have supposed that it was necessary to have a marsh to raise cranberries, but it is a fact that one of the most successful cranberry plantations in Wisconsin is on a very poor piece of sandy land, where they were accustomed formerly to grow buckwheat. The plants require to be covered in winter with water, but in the growing season sufficient water is required simply to keep the ground moist. There is a plantation of some fourteen acres in our state that I have referred to where they grow eight or nine hundred bushels of cranberries to a single crop.

Mr. Roberts. They have to overflow the land in winter?

Mr. Tuttle. All cranberry ground has to be overflowed in the winter. If the snow covers the ground so as to prevent freezing it answers the purpose, but if not covered in some way the cranberry vines will kill out, and they are quite as tender as the rose. In regard to growing cranberries the great point is to have plenty of water and to have proper facilities for using it at any time in the quantity required, in order to ensure the greatest success. I believe in our state that it is going to be one of the most important of the fruit interests.

President Smith. I have requested Mr. Tuttle to prepare an article upon cranberry culture to be furnished for publication in our report.

The following paper was then read by Mr. Underwood.

ORNAMENTATION OF HOMES.

By J. M. UNDERWOOD, Lake City.

It must be apparent to you all that very little thought is given to the proper laying out and adornment of our homes, for you can hardly find a country home that does not have some conspicuous fault in its surroundings and some of them have very many.

I will try to point out some of these objectionable features, that it may be more apparent to you that a discussion of this subject is necessary and my remark reasonable.

A common error that farmers make in laying out their grounds is to put into the foreground the most objectionable and unsightly of their buildings. Quite likely as you drive by you will see the hog-pen in front of the house, the front fence serving to make one part of the pen. If it was dark and you could not see it, you would know by the smell what was there. Very likely back in an out of the way place, you will find a flower bed wasting its sweetness in obscurity, while the hogs and their filth are made conspicuous.

Near the hog-pen you will find the barn-yard and you may have to drive through the barn-yard to approach the house, in fact I know a well-to-do farmer a highly educated man, that in going to his house one must pass through the barn-yard over a manure-pile and near a hog-pen, before you can get to the door-yard. Then you will not find a place to tie your horse without danger of its being kicked to death by the colts running loose around, or hooked by the cows that share the yard with the colts. Imagine if you can the pleasure of calling for a neighborly chat under exasperating circumstances like these.

These are no exaggerations but actual facts that I can testify to. In a timbered country a woodpile is quite certain to occupy an exalted position in front. If on the prairies we have sometimes seen wheat or other grain almost up to the door of the house. The mistakes I have mentioned are inexcusable and are too disgusting to merit anything but our indignation. In towns or cities it is nearly as bad to see

the barns in the residence portions built out to the sidewalk so that one is compelled to pass near all of the objectionable and unsightly features of a barn. Then how many persons pile their wood on the ground between the road and sidewalk and if they have any wagons or sleighs, rundown machinery of any kind, they find it convenient to store them indefinitely on what they imagine is waste ground. The city officials could abate these nuisances, but they dislike to cause any disturbance or are themselves indifferent to the subject.

In towns a favorite manner of ornamenting the surroundings is to dump ashes out in the street. I know men who for some unaccountable reason, every spring wheel all the refuse of their back yards out into the middle of the street. Tin cans, old hoop-skirts, chips and rubbish of all kinds are brought out to frighten horses and annoy persons driving by. So that in country and town I plead for an awakening to the importance and correction of these objectionable features and a cultivation of the adornment of homes.

In laying out the grounds for a home, one should locate the buildings conveniently to each other, always being careful to keep barns and out-houses in the back ground; or if on the side they should never be farther to the front than on a line with the rear of the house, and all barn yards should be back of this line. The house should stand so as to preserve a good proportion to the surrounding ground, not so far front as to make the front yard seem close and stingy, or so far back as to make the yard appear too prominent. Of course in the country one can and should be more liberal in the use of ground than in towns; but I have seen farm buildings so far from the road as to look as though they had been dropped there by chance with no thought of symmetry or convenience.

A not infrequent error in towns is to crowd the house into a corner of the lot and then in the small remaining space in the shadow of the house and the dense shade of the trees on the street, attempt to grow flowers and shrubs where grass will not even do well.

Choose an elevated situation for the house, and if the ground is level, set the underpinning up high and fill in so as to have good drainage from the house. The wall should show at least 2 ft. above the sod. I have seen houses on side hills set so low that on the upper side the ground came to the base board, and water would run into the cellar. The ground was wet and unpleasant in every respect, when good drainage was so near by. This principle should apply to barns and all out-houses as well. It is a great deal more pleasant to work in and around buildings that are up and out of the mud and dirt.

Having located the buildings, we will proceed to ornament the grounds.

GRADING.

Where it can be avoided I would not plow the ground for a yard; simply sow on blue grass seed and drag it in. In nature no attempt is made to bring everything to a level or even grade. A man's house is his own little world, and why not as far as practicable, have it look natural. If there is a mound or depression in the yard, and it is not out of proportion with its size, let it be, or you may possibly enlarge or diminish the size of either and improve its looks. Rocks, fountains and lakelets and running water always improve the looks when properly introduced, but great care must be used not to give them a stiff and unreal appearance.

When the grading is all done, we will next consider

FENCING.

In the first place, I would not have any more fencing or gates than are absolutely necessary for protection, and in this country where all kinds of stock are fenced, it is not so necessary to fence yards, and no fence at all looks better than a homely unpainted one. In cities and towns I think it looks much better to do without fences, and let the sodding come to the walk, and from the outside of the walk to the road; besides its looking better, it is indicative of the common brotherhood of man; and cultivates a mutual interest in the good appearance of all.

PLANTING.

In the first place select a patch of ground in front of the house, according to the side of the yard that is scrupulously retained for green grass. It must not be shaded by trees or encumbered with anything whatever. It should be of pure blue grass to suit me, well enriched, if possible well watered, and kept closely cut. A few well kept flower and rose beds, near the house, that can be seen from the windows on the south and east sides, are desirable. In addition to these there should be a plat exclusively devoted to flowers, the same as to a vegetable garden; but don't put the sweet flowers near the unsightly cabbages, tomatoes and onions; let them occupy a warm and pleasant spot by themselves, or, if they must be near together, set an arbor vitæ screen to separate them.

Trees and shrubs should be planted in groups. In the country set out a grove of hard maples on the north and west. Three hundred trees will make a good one. Do not set them in rows, but twelve to eighteen feet apart, with no three trees in a line. It will tax your ingenuity somewhat to do it, but it can be done. Plow this grove with one horse and a common stirring plow four or five times each summer, and in a few years you will have a joy to behold.

On the road side and bordering the lanes, plant alternate trees of elm and soft maple; plow these trees also and make them grow. The soft maple will grow up quick and furnish shade, and when they are blown all to pieces by the wind, the elms will be there to take their place. Do not allow crotches to form, and keep the heads well cut back so they will not break with the hard winds. Evergreens can be introduced in groups of three, five or more, according to the size of the yard. A good place for them is in the corners of the yard. If the grounds are large, there should be a group of nice shade trees near by where one can go to rest in their hammock and watch the children playing on the green. Lindens, Maples, Elms or Box Elders are good for this. If you have a fine view in any direction, do not shut it out by anything.

It is always nice to have one or more specimen trees on the ground. If the space is limited, cut-leaved Birch, Mt. Ash, English Alder, Larch, Weep Mt. Ash, or Weep Poplar are good. These should all enter into the adornment of larger grounds. But where one can have them there is nothing handsomer than our Burr and Red Oaks. The majestic branches of the former with its artistic covering of rough bark. The beautiful leaves of the latter that remain on the tree nearly all winter, together with their symmetrical forms, make them most desirable. Do not try to have every tree look as if it had been turned in a lathe. A rough, leaning tree with a limb broken off, looks well in a picture, and a tree artist never fails to introduce them. They give variety and make the place look natural. The Linden is a grand

tree, and I hope to see it more generally used ; it likes to overhang a stream of water, but does well on high ground, is a native and consequently hardy. Never put fruit trees in the front yard, let that be for the picturesque and ornamental alone; let the useful elements come in by themselves where they can receive the care they need.

Groups of shrubs should be planted here and there. In the front or on the side set the low growing ones, *Spireas*, *Weigelas*, *Hydrangeas*, &c., and farther back set *Snow-balls*, *Lilacs*, *Honey-suckles* and *Syringas*. Or you can put them all on a plat of ground and call it your "shrubbery," setting the higher growing varieties in the background, and the lower kinds in front. *Arbor vitæ* hedges look well on borders of driveways. They should be eighteen or more feet from each other and about a foot apart in the row. A nice evergreen border for walks and beds is *Juniper Savin*, and for an evergreen screen, almost any evergreen can be used by cutting them back severely.

Set a screen out around the back yard to hide the wood pile or any other objectionable feature.

Finally having planted the ground, take good care of it, cultivate frequently, mulch heavily, prune judiciously, and enjoy the reward of living in a beautiful home.

DISCUSSION.

Mr. Fuller. Mr. President, while I am pleased with the paper which has just been read it seems to me that the picture is a little overdrawn, and I fear that it may give the impression that we are disposed to be unnecessarily severe upon some of our farmer friends in various portions of the State.

Mr. Underwood. Mr. President, I won't take back one word of what I have said. I don't set up a man of straw for the purpose of knocking him down again. There are those that cannot educate themselves up to this idea. It is not my intention to make any attack upon farmers as a class at all; I know there are just as intelligent men in the country, who have correct ideas of how to do things decently and properly as elsewhere, but at the same time I do know that there is the least attention given to these things imaginable. It is beyond dispute that there is not the proper attention given by the farming classes to the ornamentation of their homes. Of course on the prairies out where Mr. Fuller lives their surroundings may not be so unacceptable, but it is so at least in Wabasha county, and I can call the names of farmers and men with whom Mr. Fuller is acquainted who have natural advantages for pleasant and attractive homes, but who make them actually repulsive by their carelessness and neglect. It is no uncommon thing to see farmers' homes, where in order to

reach the house, you have to drive through the barnyard and over a manure pile.

Mr. Fuller. I do not question or deny that there are not some instances of the kind referred to, but it seems to me that the impression given by the paper is a very general one; now is that true?

Mr. Smith. Yes.

Mr. Sias. Mr. President, I have been accustomed to travel over various portions of the State for a number of years more or less, in canvassing, and I can safely say that the picture is not overdrawn one particle, and I will agree with my friend Underwood. No longer ago than last fall I had occasion to call on an intelligent man and a good farmer in our county, who resides not more than six miles from the city of Rochester, and in going to his house I was obliged to drive not only through his barnyard, but his hog-yard. And I have been to many such places in this State. I will say that I once canvassed some in the South, in Indiana and Kentucky, and there it was still worse. I don't want to misrepresent our own State, or to make out that it is any worse than others in this respect, but I think that this is not an overdrawn picture.

Mr. Gould. Mr. President, I think that people when they begin to grow fruit are in some way influenced to fix up their homes, to put their back yards where they properly belong. It is hardly right, perhaps, to designate particular neighbors, but I may say here that if one will visit Wayzata, Long Lake, Watertown, and other places I might name, there are a large number of farmers who have taken no pains to fix up their front yards. But it is not so out where I live. Where people get to growing fruit they are apt to put flowers in their front yards and put things to rights. I believe this Society is proving, perhaps, the greatest benefit by civilizing people, elevating their minds, improving their habits and making them better citizens; it is doing much in that way.

The Secretary then read the following paper:

THE SELECTION OF SITES FOR PARKS AND PARKWAYS.

By H. W. S. CLEVELAND, Chicago, Ill.

Few people ever think of a park as anything but a luxury; an ornamental appendage to a city for the recreation and enjoyment of the inhabitants, to which they may resort as a refreshing change from the toils and cares of daily life in the busy streets. In selecting a site for a park, therefore, the first object, in the popular mind, is to secure the most attractive and picturesque area that is available within

easy access of the city, and then to develop and heighten the charms which nature has bestowed upon it, by tasteful and artistic arrangement, and the introduction of artificial decorations of various kinds, such as fountains, bridges, statues, vases, rustic work and ornamental structures.

In arranging the routes for parkways or boulevards also, the primary object in most minds is to secure a drive through the most attractive scenery that is accessible for such purpose. It is not unfrequently the case that tracts of land may exist in the immediate vicinity of a city of a very picturesque character, which owing to that very fact are not available for the purposes of residence sites, because no individual can afford the great cost of grading and draining them and constructing the roads by which they can be made accessible.

In such cases the improvement of a large portion as a park, and the construction of fine roads and ornamental avenues by which it may be easily reached, confers at once such value upon the whole adjacent area that the city is more than paid for the outlay by the addition thus made to the taxable value of the improved property.

The Central Park of New York affords an eminent illustration of this truth. Before its improvement by the city, it was simply a series of wild ledges, of barren rocks with intervening valleys and occasional swamps, where no man could afford to fix his residence on account of the great cost of putting even a small piece of ground in habitable condition, and the fact that even when done there would be no means of access to it. The consequence was that its only inhabitants were of the poorest class of rag and coal pickers, whose wretched hovels were clustered here and there under the protecting ledges in the midst of piles of ashes, giving to the whole district such a dreary and suspicious aspect of squalor that no stranger cared to enter its precincts. I remember well that I felt doubtful of my personal safety when I spent a day exploring it alone in 1856, when the first purchase was made of a portion of it for a park. Now to summarize the effect of the work of improvement of this area by the construction of the park, and making it accessible by fine roads; the whole cost of the park, for the first twenty-five years, including original purchase, construction, maintenance and interest was in round numbers \$44,000,000. During this period the aggregate amount of taxes collected in the wards immediately adjacent to the park was \$110,000,000.

Estimating fifty millions as the utmost increase of value which could have accrued from the ordinary extension of city improvements, there would be sixty millions left, and deducting from that the cost of the park we have the handsome net profit of sixteen millions of dollars.

This shows the wisdom of selecting areas for such improvements which from natural causes are almost valueless until they are thus made habitable; but it by no means proves that it is wise or desirable for the city to purchase large tracts for parks which are already so attractive as residence sites, that the land has attained a high value from the natural advantages it offers. Such tracts are not only very costly at the outset, but there is no danger whatever that they will ever be occupied for objectionable purposes. Instead of seeking only the most beautiful tracts for such use, which already possess great value from their intrinsic advantages, the aim should be to find the localities which from natural causes are avoided by the most desirable class of population, and liable from their consequent low valuation to be occupied for objectionable purposes, and by expending money in redeeming

and rendering them attractive confer upon them a value they could not otherwise attain. If, as in the case of the Central Park, their natural character is picturesque from its rugged and forbidding nature, the style of improvements should correspond, and their chief attractions will lie in the contrast they afford to the luxurious elegance of the surrounding city. But there are other natural causes which often render large areas uninhabitable or so undesirable that they are liable to become offensive districts unless prevented by timely forethought and wise provision for their improvement. It may be that there is danger of malarial diseases from natural causes which can only be removed by the action of the city or perhaps the state, or it may be only that a wide area is of such monotonous character as to offer no special attraction to those whose means enable them to choose a more agreeable locality, and is therefore offered in small lots at a low price and grows into a dreary wilderness of mean or very ordinary streets which are avoided by all but those who can afford nothing better.

There are miles upon miles of such streets in Chicago, lined with cheap and flimsy structures or with hideous cooking tenement houses, pregnant with disease from stagnant pools, foul gutters and filthy alleys, and apparently irredeemable from their squalor by any power short of that exercised in Paris by Napoleon, yet the mode he adopted for converting such quarters into elegant and sightly sections may teach our new and growing cities how to avoid the dreaded evil which only such arbitrary power can cure. Paris was formerly filled with narrow streets lined with low buildings. Now it is mapped out into a magnificent system of boulevards on each side of which are elegant buildings and double rows of trees.—When a boulevard is to be opened through such a precinct, the property is taken by appraisalment, —not only of sufficient width for the avenue, but for one or two hundred feet back from the curb-stone on each side. The avenue is then made and planted, and the land on each side re-arranged and sold in lots with proper restrictions as to the kind of buildings to be erected, and their distance from the street. It is well for us that such arbitrary power of eviction is impossible in our cities, but it is all the more essential that we should take such early action as may prevent the evil which can only be cured by such means.

In the neighborhood of almost all cities there are more or less extensive tracts which possess no natural features to render them attractive, and although no serious objection can be urged against them, are not largely in demand for the erection of fine public or private buildings.

As the city expands these areas fill up with streets and buildings so monotonous in their style that they can hardly be distinguished from one another, and though there may be nothing disreputable or offensive in their general character, the quarters never comes to be considered a desirable one, and can never become a source of such rich revenue to the city treasury as might have been secured by a more judicious arrangement in the first place. The lack of naturally attractive features should have been supplied by intersecting the area with broad ornamental avenues, connecting with parks of greater or less extent, so arranged and decorated with tasteful designs of trees, shrubbery, lawn and flowers as to render them attractive resorts for all coming time. The experience of old cities has amply demonstrated that the creation of such improvements, when judiciously located, never fails to give such tone and character to a wide section of adjacent territory, that sites are eagerly

sought for the erection of fine public or private buildings and splendid shops for the display of the most costly wares.

The whole location thus becomes an elegant and rich quarter, which but for these improvements would never have been other than a monotonous series of streets and blocks, offering no attractions to visitors, whether citizens or strangers. It is obvious, however, that great care is necessary in locating these areas and especially the lines of boulevards so that they may become integral portions of the thickly populated city instead of mere external pleasure drives, and this can only be attained by securing the land at an early stage of the city's growth. Chicago affords an illustration of the danger of delay, for although she has arranged a more extended system of boulevards than any other city in the country, they are all at such a distance from the present thickly peopled districts that a drive of several miles is necessary to reach the nearest of them, and many years must elapse before they can be regarded as city avenues. They are in fact only country roads magnificently arranged for driveways, with here and there a costly residence fronting upon them, but except at fashionable houses, having a deserted appearance instead of the constant throng of equipages and pedestrians which render the boulevards of Paris so attractive.

The obvious importance to the new and growing towns of this section, of timely forethought and action in arranging for these future wants which can never be supplied if we wait till they are felt, has led me to dwell upon the subject in the hope of impressing it the more forcibly upon the minds of all who have it in their power to influence civic authority. No one who reflects upon it can fail to perceive that much of the ultimate beauty, health and welfare of every town which ever aspires to be anything more than a village must depend upon arrangements which can only be secured by the exercise of timely and judicious forethought. And yet how rarely do we see it exercised. There is hardly a city of 100,000 inhabitants in the western country in which the expenditure of very large sums might not have been saved, and millions secured for the future city treasury by early attention to natural topography and adaptation to future wants in its first arrangement. In the course of thirty years' experience as a landscape gardener, I have so often witnessed the almost inestimable losses resulting from neglect of opportunities, the value of which was not realized till too late, that I cannot express too strongly my sense of the danger of delay, or condemn too earnestly the "penny wise and pound foolish economy" which can never look beyond immediate necessity and rise above the meannesses of petty trading.

There is, however, another aspect of the question which is of scarcely less importance, and is certainly of wider significance than the one I have thus far considered. I allude to the reservation for public use, of large areas which from special, natural or other causes possess such interest to mankind at large that the whole world has a claim upon them, as a gift from almighty power which should be held sacred from the modifications to which the greed of man might subject them. The national government has recognized this principle in the reservation of the Yellowstone Park, and the State of New York has followed suit in securing Niagara Falls and a large area of the Adirondack region to be forever preserved as public domain.

Some action has been taken in the Minnesota legislature towards securing an

area around Minnehaha Falls for a similar purpose, but thus far it has been but a feeble effort and no practical result has yet been reached. The region possesses no such features of sublimity or grandure as Niagara or the Yellowstone, but it has nevertheless a sufficient claim for consideration from various causes to render its preservation a matter of vital interest and importance.

It possesses in its natural features enough of the picturesque to make it an exceedingly attractive feature of park scenery, and although it cannot aspire to such intrinsic elements of sublimity as Niagara, it has been invested with such poetic associations as must forever hallow its precincts with a charm which all the world will recognize. When in addition to this we consider the fact that its situation is such that it must of necessity become a central point of a very thickly peopled region, while from its topographical character it can hardly fail, if not improved for public use, to become a disreputable quarter, and a disgrace to both the cities in its neighborhood, the only verdict that can be reached in regard to the question of its reservation, is that it has already been too long delayed.

In regard to other appropriate areas for similar use it is enough to say that a State Horticultural Society could hardly discover a nobler object for energetic action than the seeking out and urging upon the Legislature the preservation of such tracts as may be available whose intrinsic character renders them especially interesting.

In the wide region embracing the sources of the Father of Waters, such areas must exist whose value and interest will only increase with time and population.

The following paper was then read:

EVERGREENS AND THEIR USES.

By A. W. Sias, Rochester.

This subject is fraught with such magnitude and vital importance to all, but more especially to the pioneer settlers on our northwestern prairies, that it almost staggers a person of human, sympathetic feelings to contemplate it; and every cold blast from the north reminds us again of the stern fact, that it should be the duty and ardent desire of every owner of a quarter section of land on the open prairie, to surround the same with a thorough shelter belt of evergreens at his earliest possible opportunity, and not to forget the shelter of his buildings, stock yards, orchard site, etc., with a closer screen, at the same time. Now what shall we use for this all important business of

SHELTER BELTS?

"Self preservation is the first law of nature." So we will take up this part of our subject first. Did it ever occur to you how few people live up to the kind requirements, superior advantages and happy possibilities of the just law of nature? How wisely, profusely and generously, do we find native evergreen nurseries scattered all over this broad country, where fine plants can be had for almost the cost of digging and packing, and yet how few, comparatively, ever avail themselves of the marvelous wealth stored away in these rich mines. Nature has made ample and abundant provision for all the varied wants of mankind; made it possible through united effort, and the judicious use of trees, to so clothe the earth with

rich verdure as to render the blizzard and tornado almost harmless. Said the lamented Hodges, "trees are the prime factors in the whole business." Will name half a dozen varieties for shelter belts, and class them according to the best of my knowledge as to their merits for screens or wind breaks. There are many more fine sorts that might be named for this purpose, but we do not feel at liberty to trespass further upon the time and patience of the convention, than to just lay some of the claims of these before you, and so open the subject for discussion.

Viz: 1st, Norway Spruce, (*Abies Excelsa*;) 2nd, White Pine, (*Pinus Strobus*;) 3rd, Red Pine, (*Pinus Resinosa*;) 4th, Hemlock Spruce, *Tsuga Canadensis*;) 5th, White Spruce, (*Abies Alba*;) 6th, Scotch Pine, (*Pinus Sylvestris*;) We head the list with the Norway Spruce, first, because it is capable of resisting a stronger wind than either of the others, unless it is the white spruce, (and that is too small a tree to stand at the head;) second, it has more fibrous roots, hence less loss in planting; third, it is a fine looking tree; Josiah Hooper says, "of all the hardy evergreens this appears to be the most suitable for shelter, dense and compact in its growth, hardy to the utmost degree, and vigorous in almost every soil, it is certainly the perfection of plants for a screen. We must confess to having nothing that will compare with this in valuable tree for all purposes "

State and national pride, when not carried to excess, is noble and commendable—but truth and justice should be held in still higher reverence. And the truth compels me to admit that the Norway spruce has done more to protect, and adorn American houses, than any other tree. In Lapland, we are told, that it grows within 3,100 feet of the line of perpetual snow, grows from 120 to 180 feet in height, and from three to five feet in diameter, and said to be the largest conifer in Europe. "Downing considers it by far the handsomest of the spruces." Next in order comes those old boon companions white and red pine. The white pine is so well known all over this country, that it is only necessary to say, that we have no native or foreign pine, more hardy, larger or by nature so well adapted to shelter belts as this, and as the noble red pine has stood proudly by its side in all past ages, in its native habit. We should not deem it wise to part them when called on to assume their rightful places in shelter belts to guard the lives and fortunes of the pioneer settlers on our western prairies.

4th—HEMLOCK SPRUCE.

To know this tree—"is to love it" and I hope all objections to this sylvan beauty will flee when it becomes generally known that it grows as far north as latitude 65 or 67 degrees, and that all it wants is partial shelter from the drying winds—hence we place it between the pines and spruces in our shelter belts. We have a specimen about 20 feet high, that came through last winter in perfect condition.

5th—WHITE SPRUCE.

It is a fact, that I think is not generally known that the *Abies Alba* is indigenous to southern Minnesota. In passing through Fillmore County twenty-six years ago this winter I found a few of these native trees, some that had been transplanted into settlers yards near by are now about fifty feet high, and beautiful trees. My nearest neighbor, M. J. Hoag planted one of these native trees into his grounds in 1876, for a centennial tree. It now stands eighteen feet high, and blue as the blue-tinted sky, very dense, and perfect in every particular.

6th—SCOTCH PINE.

This is the least desirable tree of the lot, the crookedest, most open headed,—but as it makes a rapid growth, and is hardy, it will do to put on the out side, to guard the finer trees of your shelter belt. Seeds of this tree in Northern Europe are extremely plenty and are being shipped out by the carload, and there is danger of this tree being cultivated too extensively in this country, to the exclusion of our better native pines.

FOR LUMBER.

We are told that “pines made their appearance long before ordinary trees, in what geologists term the mesozoic age.” This accords with all creative wisdom, nothing made in vain, or out of season. The pines, everything considered, for all economic purposes, are doubtless the most useful plants in the whole universe. They were the first trees needed owing to their superiority over all other plants for architectural, mechanical, and perhaps I might add medical purposes. The white pine is the most remarkable tree for lumber in the northern states, and perhaps we might say in North America. Whoever saw a building of any pretensions at all, where white pine was not used in some parts of it? I mean in the north. Most people know there’s a mine of wealth in the pine family for the manufacture of the different kinds of lumber. Evergreen lumber stands unrivaled for general purposes.

ORNAMENTAL HEDGES.

We are not lacking in Minnesota for the very best material for ornamental hedging. The American Arbor Vitæ (*Thuja Occidentalis*) and its many beautiful varieties, are unrivaled for this purpose. In damp, sheltered situations the Hemlock Spruce, (*Tsuga Canadensis*) makes a beautiful hedge. Ornamental trees for extensive home grounds first, Hemlock Spruce; second, Norway Spruce; third White Spruce; fourth, Siberian Fir; fifth, American Arbor Vitæ and its many choice varieties.

Evergreens for grounds of quite limited extent. For this purpose we recommend nothing but the dwarfs, viz.; *Thuja Globosa* Arbor Vitæ, *Thuja Compacta*, *Pyramidalis*, *Siberian Arbor Vitæ*, *Prostrate Juniper*, *Tom Thumb Arbor Vitæ* and other hardy dwarf varieties.

LEAVES.

Gray says: “The actual amount of surface presented by a tree in full leaf is much larger than one would be apt to suppose. Thus the Washington Elm at Cambridge—a tree of no extraordinary size—was some years ago estimated to produce a crop of seven millions of leaves, exposing a surface of 200,000 feet or about five acres of foliage.

Noticing the very long, beautiful, dark-green leaves on the Red Pine, I had a curiosity to know how they compared with the more common, but less desirable Scotch Pine, whose leaves are less than half their length. Knowing that leaves are a most important part of a tree, and should be very carefully studied and compared, one variety with another, in determining their relative value for shelter belts, etc., I cut a branch eight inches long from the ends of the branches of these varieties and counted them, with this result: Red Pine 444 leaves, Scotch Pine 348. Showing a leaf surface of more than double in favor of the Red Pine.

RADIATION OF HEAT.

There is no doubt but what some trees emit more heat than others, and it would be a matter of much interest to know just what varieties are the most valuable in this respect. Will a tree carrying double the amount of leaves of another have any advantage in this respect?

Some twenty years ago, Andrew S. Fuller said: "The pines of our southern states furnish immense quantities of fuel, pitch, tar, resin and turpentine, and so great is the production of the last named articles, that we have exported in a single year more than a million dollars worth, besides the vast quantities used at home." But we need pines in the north for fuel much more than they do in the south, and we can grow them just as readily as they can. Winters like 1884-85, when it gets intensely cold, especially on the open prairies, we need fuel that will produce intense heat in just the shortest possible space of time, and the different varieties of pitch pine will do it. *Pinus Regida* is found in nearly every state in the Union, and is one of the best for this purpose. *Pinus Resinosa* is good. There is a pine found on the Blue Mountains of Oregon in latitude 46° that is equal to our pitch pine in resinous matter, it may prove the same.

The meeting adjourned till 2 o'clock, P. M.

AFTERNOON SESSION.

FRIDAY, JANUARY 22, 1886.

The meeting was called to order promptly at two o'clock P. M., by President Smith.

Mr. Harris stepped upon the platform and said:

Mr. President:

I desire to ask your indulgence for a moment.

About a score of years ago a little band of public spirited men joined together in laying the foundations of this Society. Its beginnings were feeble, but it has survived the dangers of its infancy and is now what we see it, a robust and vigorous youth, full of promise, and is doing more than any other organization in the State to kindle and to gratify horticultural tastes and to elevate Horticulture as a profession. It has been my happy privilege to put in some of the best energies of my life to develop the resources of the great State of Minnesota and to improve its horticulture. I have been in my humble way an advocate of home adornment and of the supplying of the tables of our people with an abundance of fruits and vegetables of every kind, of

surrounding the homes of our people with everything that could in any way contribute to their comfort and happiness in this life and point them to a better life to follow this.

Some of my co-workers have already passed over the river to the beautiful land beyond. I still remain with you, but feel that age is beginning to creep fast upon me. I cannot always remain one of your number, but I hope that my labors may be somewhat remembered and that when you lay me to rest that you can say as you look over the few brief pages of my earthly record, "that man did not live wholly in vain, but he wrought for others, and the little spot of earth upon which he lived is better for his having lived upon it." And to remind you of me when I have passed away I take pleasure to-day in presenting you with a picture taken last week, which I think perhaps is a very correct likeness of the man whose name was first signed to the roll of membership of the Minnesota State Horticultural Society, one who has never forgotten the interests of the Society and never shrunk any duty which he was called upon to perform, but who in sickness and in health, in poverty or in prosperity, has been with you and stood by you, whose best wishes and desire is that the State Horticultural Society may have a brighter future, that it may in its work accomplish the greatest good to the greatest number of people, and in the end convert our beloved Minnesota into the most desirable place of human residence upon the face of the earth. I hope that through your instrumentalities the time may hasten when all our prairies will be dotted over with well cultivated farms and comfortable homes, when the various products raised may be ample to meet every demand and when the richest down to the humblest person may have an abundance of the most luscious of fruits, so cheap that all can afford to partake to their fill.

Mr. Secretary, I place this photograph in the hands of the Society. [Applause.]

Mr. Sias. Mr. President, I stood by the side of this teacher in the day that this Society was born, and I have been a student under him ever since. I think it was General Lafayette, when sitting for a painting, instructed the artist to "show the wrinkles and all," and I am glad to know that Brother Harris had his fine likeness presented to the Society in the same true-to-life way. A good man might be compared to a birds-eye maple, the more concentric rings it has the greater the value of the tree; and so with Brother Harris, the longer he labors in his efficient and unselfish way for the good of our Society, and for

the cause of horticulture throughout the whole country, the more wrinkles will he carry and all the more firmly will he be established in the hearts of every true pomologist.

Some future day when our Society shall have a fine hall of their own, the likeness of the member who produced the greatest number of object lessons on the first day of our organization, and for many years afterwards, and the member who was always so kind and gentlemanly to all, ever returning good for evil, will not be the least appreciated among the many good pictures that shall grace its walls from time to time as years roll on.

Mr. President, I move you that the Secretary be instructed to place a frame around this picture, and to present it to the Society in that shape.

The motion was adopted.

CORRESPONDENCE.

The following communications were read by the Secretary :

FROM KANSAS.

GENEVA, KAN., Dec. 24, 1885.

S. D. Hillman, Secy., etc.:

My dear fellow worker: Although I have never had the pleasure of meeting you, or in fact, but few of your State horticulturists, I have often wished to do so. Somehow I have never traveled that way, but hope to visit your State perhaps next summer. It has, within the last few months, become my duty, among other things, to meet with the various state societies whenever possible, and I hope it may be so that I can find it convenient to meet with your Society.

I should like to know the plan or rules that govern the time and place of holding your meetings. It is my desire to get some plan carried out by which the neighboring states can hold their horticultural meetings in succession instead of at the same time as is often the case. At present I have a trip laid out to meet the societies of Iowa, Wisconsin and Michigan from Jan. 19th to Feb. 9th. The Commissioner of Agriculture says there is so little money in the contingent fund that we must be very economical in incurring expense. You may not know that he has appointed me "Pomologist to the United States Department of Agriculture," as a step towards establishing a Pomological division in the department which shall serve the country with the aid of the government to back it. Such a thing has never been attempted before in a national way, and it is hoped this move of the Commissioner may be seconded by the permanent establishment of the Division, together with an appropriation sufficient to carry on the work, and then better things may be looked for.

H. E. VAN DEMAN.

FROM WISCONSIN.

FORT ATKINSON, WIS., January 20, 1886.

The program of the meeting of your State Society at hand and examined. It is a splendid one, and judging by your last year's report will be splendidly carried out. We have the reports of most of the states and find none better, and but one or two anything near as good. We hoped to have the pleasure of meeting with you this year, but find it impossible to do so.

We enclose two dollars for which please add our names to the list of members, and if we are entitled to two reports we would be glad to get two.

Wishing each and every member of the Society a happy and prosperous year we are,

Very truly yours,
COE & CONVERSE.

FROM WABASHA COUNTY.

PLAINVIEW, MINN., Jan. 4, 1886.

Yours of December 31st came duly to hand. Would say that we had the hardest winter for fruit last year that we ever had here. The Duchess went through all right; the Tetofsky all killed; Ben Davis, Wealthy and Bethel were all killed. The Bethel has stood the winters for twenty-six years. Some seedlings that stood for twenty-six years went down last winter. On the Whitewater river on low ground the Duchess are all killed. If we keep planting we shall find some varieties that will stand the winters. I have a seedling that is hardy as an oak; this is the second year of bearing. The apples are about the size of the Hyslop, are of fine flavor and show no signs of decay as yet.

Yours truly,
GEO. W. HARRINGTON.

FROM MURRAY COUNTY.

BALATON, MINN., January 5, 1886.

DEAR SIR:

Your favor of December 1, last, and also program of winter meeting came to hand, and I am sorry I cannot this year attend the meeting, but hope to do so next winter.

I send you herewith a sort of report of condition of fruit and fruit trees, etc. There is little to report upon from this county yet, as a very small proportion of the apple trees planted are old enough to be fruiting, yet I think the majority of those who have settled this county have some interest in fruit culture and with some direction and encouragement in the way of information of how to do it, they would do more than they have done. The way our farmers buy of the tree-peddler I should say they have a desire to raise their own fruit as well as improve their homes.

It is to be regretted that those peddlers are mostly representing Ohio and Illinois nurseries and sell mostly varieties not suitable to this country. Nevertheless some of our State nurseries have become known, and better results will hereafter follow as these have, and I believe try to sell mostly such varieties as will do the best here.

I feel confident that every farmer throughout southwestern Minnesota can raise all the fruit he needs for his family. We all need enlightenment and information how to plant and care for it when planted; and then I think the time spent and money invested among the trees, bushes and plants will be both pleasant and profitable.

There is chance for work by our State Society in this southwestern part of the State if you can in some way reach it.

Acting on your suggestion as to a county society, I have interviewed some of those most interested, or ought to be interested, and I think we shall have a county society before the next new year.

Deeming it better to do something, if ever so little, than nothing at all, we organized a society for our town on new year's day and though only eight were then present and joined, we shall increase and we shall try and keep alive, at least, till we get a society for the county.

Very truly yours,

O. F. NORWOOD.

FRUIT REPORT FROM RAMSEY COUNTY.

By W. E. BRIMHALL.

ST. PAUL, Jan. 19, 1886.

Small fruits are grown quite extensively in this vicinity. Strawberries were a full crop and were more plentiful in the market than was ever before known. The estimate of the amount sold in St. Paul market during the best of the season was thirty thousand quarts per day. Many of them came into market in bad shape and bad condition, consequently they sold at a low price. Some were sold as low as three to five cents per quart, while at the same time those in good condition and in suitable packages commanded a much higher price.

If growers understood and practiced the best methods of growing and marketing fruit, they would get far better prices than at present. New quart boxes in crates, I find much more profitable than any other shape for marketing berries. The Wilson is yet the king of market berries for all purposes. The Crescent Seedling and Old Iron-Clad range next in our market. The Downing does well on light soil and brings equally as good prices.

Of Raspberries, the red predominate, with Turner, Philadelphia and Cuthbert.

Plums were a full crop this year. Our wild or native plums were all heavily loaded and we have some very choice varieties worthy of cultivation. They require good cultivation and an annual dressing on the soil.

Apple trees came through the winter badly demoralized by the severe cold weather. The Duchess is still the leading variety. The standards were a light crop, being small and irregular in form and size. The Transcendent crab is yet the leading variety and is more generally grown than any other. I sold 1300 bushels of them in our markets. They were hand picked into bushel baskets and carried to market in spring wagons and sold readily, averaging me sixty cents per bushel. Another variety worthy of mention is the Early Strawberry crab. The trees bore profusely. The fruit ripens early and is very nicely flavored.

In conclusion allow me to say, there are fine chances for young men who take an interest in fruit growing, to engage in the enterprise and with due diligence and skillful hands crown their labors with success.

FRUIT REPORT FROM HOUSTON COUNTY.

By J. S. HARRIS, La Crescent.

The only varieties of apples in my orchard that have stood the test of the last three winters without receiving any perceptible injury are the Duchess of Oldenburg, Tetofsky, Peach, two or three other varieties of Russians, Whitney No. 20, and some of the Siberians. The McMahon White and occasionally a Wealthy show but slight injury. A portion of the remaining Wealthy, St. Lawrence, Talman Sweet, Plumb Cider, Haas, and occasionally an Utter, will probably recover and bear fruit, but not become sound trees. All of the Russets, the Bailey Sweet, Seek-nofurther, Winesap, Autumn Strawberry, Fameuse, Pewaukee, the older Red Astrachan and Walbridge, are totally ruined. My experience and observation go to prove that a northeast exposure is the best for an orchard site and that orchards upon high and dry land are less liable to be killed in such extreme winters than those situated in low valleys.

The last winter was the most disastrous to trees of any one I have experienced in a residence here of twenty-five years. I am in no wise disheartened by the losses of last winter, but have full faith in the final success of fruit culture in Minnesota. I shall replant my orchard, using for the purpose, largely, two-year-old trees of the Wealthy and McMahon White, the most promising seedlings I can procure, and enough of the newer Russians to test their adaptability and ascertain which of them are most desirable for cultivation in this State.

My location is in the town of La Crescent, Houston County.

Mr. G. W. Kellogg was here requested to present his paper on Small Fruits for Profit.

Mr. Kellogg. Mr. President, I don't know how many minutes you design to allow me but I will try to be as brief as possible. I must charge it all to my friend Elliot for getting me into this scrape. Before reading what I have written I would like to say that since I left home I received a communication from Hon. Norman J. Colman, the Commissioner of Agriculture, giving the names of some thirty-two kinds of Russian apples of which he has been distributing cions. I received a small bundle of them and two copies of this list.

I should like to criticise somewhat, had I time, some of the reports from our Experimental Stations. One thing that I want to mention is this: when you top-graft any variety on the crab it is no proper trial at all; I think experiments should all be made upon root-grafts. We should grow them from the ground if we want to conduce to their reliability and hardiness.

The Secretary assigned to me as a topic "Small Fruit for Profit," but did not say profit for whom, so I take for granted that farmers are the ones that read your report, and who want the profits.

SMALL FRUIT FOR PROFIT.

By GEO. J. KELLOGG, Janesville, Wis.

Mr. President, Ladies and Gentlemen:

Would you plant for profit? plant for the loved ones at home, health, pleasure and real good cheer.

Every farmer should have one acre devoted to garden and fenced so the fowls will not intrude. I would have this plat 8 x 20 rods so it could be easily worked with a horse. On one side six feet from the fence I would plant for the 1st row—pieplant, currants, gooseberries and blackberries; 2d row—8 ft. x 3, early and late black raspberries; 3d row—8 ft. x 2, early, medium and late red raspberries; 4th and 5th rows—first one 6 feet from raspberries, second one 4 ft. x 2 ft. apart in rows, early, medium and late strawberries; one row I would plant with pistillate varieties, the other with perfect flowering kinds, plants 4 x 2 ft., and I would not let the kinds mix by running together; if my rows were not so long I would prefer to plant 2 rows of each kind and have four rows abreast; for persons having only a single lot I would have the same varieties and quantity to suit surroundings. Let it be kept in mind that one square rod of ground has produced five bushels and over of strawberries in a single season, and one row twenty rods long set with 100 plants has given the following year over 500 quarts.

I would plant one dozen grape vines on the sunny side near the fence, near the house or in an arbor.

If I could have my choice of ground would prefer a deep, rich sandy loam, underlaid with clay and limestone, slightly sloping to the south, so that no water would long remain on the surface, but whatever the soil I would plant and succeed. I would make the ground as rich as I dare for corn,—say forty loads of well rotted manure to the acre, plowed in the fall, and twenty loads more spread on the surface and well harrowed in before planting in spring; the great secret of success in small fruits of extra size, lays in properly applying good stable manure in large quantities, first, before planting and afterward by mulch to protect from drouth and to increase and continue their fertility.

The blackberries and raspberries should not be stimulated to late growth, but so mulched that there need be no failure for lack of moisture in seasons of drouth.

The three great needs for small fruits are rich soil well drained, clean cultivation, and plenty of water.

The water may be applied successfully from reservoirs by trenches better than by hose. If you attempt this artificial watering by hose do not do it while the fruit is in bloom, and make all applications at sundown from water that has stood in the sun at least six hours. It is better to depend on mulching than artificial watering.

Procuring plants is of greater importance than preparation of ground. Such varie-

ties as are succeeding in your vicinity on soil similar to your own, will be a success; be sure these varieties are pure, not taken from an old bed where they are all mixed up or bought of a traveling bummer who cares nothing for you only your money; get your plants from some reliable person in whom you have confidence, and if not acquainted with the kinds take his advice; giving your soil. As soon as the ground will do to harrow well have your plants on hand and set early in spring as possible, if rainy weather interrupts after plants are received, undo the bundles and dip the roots in a puddle made of soil and water, lay them in layers in earth but do not wet anything but the roots. Never water strawberries in the bundle. Set strawberries first, and the buds no deeper than level with the surface of the ground. A spade is the best tool to plant with, let the opening be deep enough to receive the roots without doubling up, but unless you have plenty of money don't dig a hole and make a mound and set the plant and all the roots arranged about in perfect position; it won't pay. All other plants are better set a little deeper than they stood in nursery rows.

The following kinds I have never known to fail when properly treated on any soil: Currants—Red Dutch, Victoria, and White Grape. Blackberries—Snyder, Stone's Hardy and Ancient Briton. Black Raspberries—Tyler, Souhegan and Gregg. Red Raspberries—Turner, Brandywine and Cuthbert. When you treat the suckers as weeds and destroy them or if you wish those that sprout but little, Philadelphia, Purple cane and Shaffer's Colossal, Marlboro, Superb, Hansell and many others I might name, good and good for nothing; among the six red first named you can be suited. Of Gooseberries, plant Downing, Smith's and American Cluster. Strawberries—Crescent and Countess for bushels, Wilson and Windsor Chief for canning and long shipments; Manchester, Miner's Great Prolific, Longfellow and Boone for size, Atlantic and Prince for quality. I will not mention aloud, Rany, Jewell, Cornelia and a host of others on which we expect to make our fortune, nor will I burden you with the one hundred varieties on which I have lost a fortune in the last thirty years.

Of Grapes the best black are Moore's Early, Worden and Concord; best red, Brighton and Delaware; best white, Lady and Niagara; easiest grown of any, White Elvira; best for arbor, Janesville.

Now if there are any farmers who have plenty of ground, or others owning but a single lot, who would like to invest ten dollars at one hundred per cent interest, let me tell you how, and the interest will be paid promptly fifteen months from the investment in that that is better than gold.

Just let your good wife or boy or girl take charge of the garden; you see it is properly fenced so the chickens will not get in, you furnish the ten dollars to buy plants, and if you can buy to better advantage than they, (and all men think they can) procure the plants for them, write to or see some reliable dealer and tell him what's up, and that you don't want anything that won't pay 100 per cent interest, and you want to invest only ten dollars. Keep one dollar to pay express; order 200 strawberry plants, \$2.00; 100 currant cuttings, \$1.00; 150 raspberry plants, \$1.50; 100 blackberry plants, \$2.00; pieplant, 50 cents; gooseberries, \$1.00; grapes, \$1.00; total, \$9.00.

Give the boy the team to draw all the manure he wants, or let the wife or girl have the hired man to do this work, and if you are very particular keep the account

of all time and expenses and charge it up, but mind you want to agree to take and use in the family all the fruit they can raise for five years on one quarter of an acre of this garden at a fair market price.

Now my boy, with the ground properly prepared, have the plants on hand early, but not before the ground is ready to look nicely, set immediately, cultivate and hoe every ten days, keep them clean, run the strawberries up and down the rows forming narrow beds two feet wide, pinch off the fruit stems so as to give vigor to the plants, and be sure to keep the weeds down before they get an inch high.

In November before the ground freezes, take a six-tined or spading fork and loosen about the raspberry and blackberry roots and with the foot at the ground and the fork on the top, tip the plants all one way and cover with earth; from two to five minutes will cover a plant that will give you from two to ten quarts of nice fruit. The grapes cut back to one foot and cover the same. When it freezes so to bear a team, cover the strawberries with marsh hay or straw manure free from weed seed just so you cannot see the foliage, and cover well the patch and outside of the rows. In spring leave this all on, if the plants can't get through open up a little; do not cultivate or hoe until after fruiting, hand weed what is necessary. The plants that have been bent over and protected should be uncovered as soon as frost is out, raised in position and earth pressed around them to hold them up, and a good mulch of manure given them each spring; cultivate lightly, thoroughly, but not deep. Keep this part of the fruit garden clean, and if raspberries and blackberries send up sucker-plants cut them off as weeds.

When strawberries ripen, pick one-half the beds each day, keep account of each day's pick and charge them up at what they are worth in market, but don't compare them with the sour berries shipped a thousand miles.

As strawberries give out, raspberries will need picking—then will follow blackberries.

As strawberries get very plenty, hold the proprietor who furnished the land and the ten dollars to his agreement, eat all you can three times a day, can all you can, and then rather than have any family trouble, buy boxes and furnish your grocer.

An old plan of picking strawberries, cut from Green's Fruit Grower is still often practiced:

The strawberries blossomed and gave great promise of an abundant harvest. It seemed evident that we should not only have a supply for ourselves, but for our neighbors also. Therefore I invested \$10.00 in crates and baskets, for the purpose of marketing our surplus. We did not have the least trouble in getting our berries picked. We had an old hen with a brood of ten chickens that picked every one of these strawberries. The old hen was the most successful strawberry picker I ever met.

Thus I have briefly described the first season. Early in the spring after the first planting, prepare another strip for two rows of strawberries and be sure you set plants that have not mixed; these can be taken from the outside of your beds. Keep the kinds pure, and keep this new planting clean as before—and be sure to set a small bed each spring. The strawberry bed after the first crop will become weedy; cultivate, hand-weed and mow and let it remain as long as it will yield at the rate of 100 bushels per acre; then plow under, for this reason the strawberry bed should be on the outside of the other fruit, these will increase in productive-

ness for four years when the blackberries and raspberries will yield from six to ten quarts of fruit per hill. Your currants, gooseberries and grapes will come to bearing the third year, and at the end of five years if you have not paid for all labor, the land, and all expenses and 100 per cent. interest, beside saving from \$25.00 to \$100.00 doctor bills each year, then I have missed my calling and don't know what I am talking about.

This I consider the best way to grow small fruit for profit, and it will encourage the boy to let him have the proceeds after the family are supplied. If you want to keep the boys at home, let them have an acre and see what they can do for themselves, you will find they will often beat the old man.

Now, I presume many of you expected I would read a paper to tell these veteran fruit growers how to grow small fruit and get rich—you that raise from 100 to 1000 bushels of small fruit every year. I can't do it; but don't spread yourselves out too thin, and try to cover too much ground; don't run after all the novelties. Stick to the old paying sorts, use all the manure you can and not swamp the plants; deep ploughing, heavy manuring largely on the surface, early spring planting, clean cultivation, matted rows, timely mulch, winter protection, good seasons, good pickers, good markets, good prices, and you will be happy.

Grape growing has been and may be profitable to the farmer. Cut back your bearing vines to two eyes of the new wood, put them down and cover; tie them to stakes or trellises in spring, and when the blossoms appear pinch off the shoot, one or two leaves beyond the fruit. The Janesville and Oporto will pay to plant by a dead tree or arbor, and never prune. Go to these when you want sour grapes and try and be happy.

Currants and gooseberries will pay if you give the worms for a change in diet, White Hellebore and Paris Green.

Again I say manure and mulch, and mulch with manure.

I know not what the possibilities of strawberries are. I know of amateurs who have produced five, five and one-half, and five and three-fourths bushels to the square rod in a single season. If this can be done on one rod why not on one acre? Why not grow 1000 bushels of strawberries, the queen of all fruits, on one acre in one year? I know of one man who reported to me of growing five bushels from three plants and their increase, the following year.

The following are cut from Green's Fruit grower since I left home:

"265 quarts of strawberries were grown upon a bed between two and three rods square, selling for \$40.00. The owner in addition, sold \$48.00 worth of plants from this plot. Between the rows of strawberries he had raspberries, picking eighty-five quarts which sold for \$27.75, but you must not plant ten acres expecting such a yield."

E. K. Frost of Chapin, Iowa, with whom I am acquainted, and can vouch for the truth of statement, says:

"I now have nearly all the new, highly prized varieties—twelve on trial, not fruited much yet. I intend to select eight or ten varieties out of fifty now on hand that suit me best, and drop all others. My soil is light, prairie, sandy loam—loose subsoil of firm gray sand, yellow clay and magnesia, well underdrained with rock ten to twenty feet below. No water ever stands on surface unless ground is frozen. Season of 1884 I sold from seven-eighths of an acre 150 bushels of strawberries,

besides home use. We have not been out of canned fruit in eight years—100 quarts now on hand. I am 74 years old; have done all the work of fruit growing except picking; have cleared for my labor \$1,000."

Now if anything I have said or written seems improbable I will refer to the fact that when a boy I was once mistaken for a little Indian; and that reminds me of the drunken white fellow who tried to convince a squaw that they were related. She very indignantly wanted to know "how?" He replied by Adam. She instantly retorted, "me glad it no higher!"

If there is no Indian blood in me I have got nearer to the truth than the Indian hunter did who sold a deer for whiskey. He told the tavern keeper it was on the big tree down in the big meadow; he sent and found the meadow and the tree, but no deer. The Indian's explanation was, "Pretty good for Injun, two truths to one lie."

DISCUSSION.

Prof. Porter. Mr. Chairman, there is one point in regard to mulching of plants or preparing for transplanting. In my experience I have found a very good mixture in which to dip the roots to be one-half common garden ground and one-half fresh cow-dung. I have found that to be the best mixture for puddling that I can use. In the first place you have the advantage of the particular fertilizer in the condition that makes it ready for use for the plant; and in the second place it is impervious to the atmosphere, and prevents the drying out of the small, fibrous roots.

Mr. Smith. It will retain moisture longer than anything else you can get.

Mr. Kellogg. I regret that there is so little time left us for discussion. But I want to say that the executive ability of the Chair is simply wonderful, and I think I have never yet seen in all the conventions I have attended so much real work crowded through in the same length of time.

Mr. Pearce. What do you find to be the best fertilizer of pistillate varieties?

Mr. Kellogg. That is very hard to answer. I use Wilson, Capt. Jack, Countess and Crescent put together; one pistillate and one staminate. I would say in regard to picking strawberries that I never found a person that picked 239 quarts of berries in a day, except where they picked the Countess.

Mr. Hoag. What do you call the Countess; is it identical with the Downer?

Mr. Kellogg. The name originated here; I don't know where the plant originated. Downer's Prolific is claimed to be the same as the

Countess but I have known them to grow side and side and I find they differ.

The following paper by Mr. Whipple was then read:

REPORT ON GARDENING AND SMALL FRUITS.

By K. H. WHIPPLE, Northome.

I find that I am placed in a bad position for me to fill, that is, to give you a report on Vegetable Gardening alone; being so far back from the large markets of St. Paul and Minneapolis and not knowing but a very little about the vegetable gardens there except the daily report of sales. My garden being altogether different from those around the cities, where each gardener selects what he wishes to grow and makes a speciality of, perhaps from three to six different kinds of vegetables and places his whole time on those; while I have to grow all kinds that I can grow including some varieties that I have not yet seen in the Minneapolis market; also, small fruit such as strawberries, raspberries, currants, gooseberries, &c., or in other words, everything that the summer resident on Lake Minnetonka calls for.

Vegetable garden and small fruits generally around the lake were good.

We had a hard battle with the common enemy of the gardener, known by the name of the cut-worms, they being more numerous last season than ever before known. In spite of all we could do, our earliest planting of beets, parsley, lettuce, raddishes, turnips were all taken,—not one left; and out of 1,500 early cabbage we managed to save between three and four hundred.

The worms are of two varieties, the old gray worm and the other being nearly black and at least one-third longer, and what seems the most singular they are nearly all full grown when they first appear; they seem to have a general concert of action as a large number make the attack at the same time. Several of the small fruit growers complained of raspberry plants failing to grow; on examination we found the trouble to be the work of the cut-worm and cutting the new shoots about the time they were ready to break the ground, which to the blackcap means ruin, and nearly so to the red.

Small fruit where not killed back too much last winter gave us a good crop. In red raspberries the Philadelphia, (all things considered,) were the best, Turner's next and Cuthberts last or least, being tender and killing back the worst.

Doolittle best of the black; Greggs almost a failure on account of winter killing.

Grapes came out splendidly where they were taken proper care of all around the lake.

Apples were nearly a failure, trees being so badly injured the past winter that they could not produce fruit, excepting that variety which so many orchardists and nurserymen have condemned and had stricken from the list of hardy fruit, because they at certain times and in certain localities were troubled with the blight, but in spite of all talk, disease and the cold winters which have played such havoc with our orchards, my Transcendents have stood them all for the past twenty years, and last season I could not discover the first blighted leaf in the whole orchard and the trees were well loaded with fruit. The orchard to-day resembles an old-fashioned New England orchard.

Would it not be best to recommend when setting an orchard at least to set one at each corner of the orchard for landmarks, or for ornament and to give the family fruit while they are living in hopes of something better.

The Secretary then read the following paper by John F. Dayton, President of the Alamaakee County Agricultural Society :

AN ARGUMENT FOR THE MORE EXTENSIVE CULTIVATION OF SMALL FRUITS.

By JOHN F. DAYTON, Waukon, Iowa.

Since the recent severe winters have demonstrated that the culture of winter apples in the northwest is almost futile, and the peach and pear cannot withstand the extreme cold of this section, while the cherry seems also to have abandoned us, the inquiry arises, "Upon what must we depend for our fruit supply?"

Fruits are now recognized, not as luxuries, but as necessities; health requires that the system of man receive the benefits of their cooling acids during the heats of summer, and in winter they are equally necessary to combine with the heavier foods of that season. As we are precluded from growing fruit that will keep fresh during the winter months, and as the products of regions with milder climate are expensive, and difficult to obtain except in the larger cities, most persons rely upon dried fruits or the canned products of eastern factories for their supply; in these forms fruits have lost much of their delicate flavors and many of their valuable qualities, and have not the cleanliness and healthfulness of those put up at home.

While horticulturists are laboring to originate and while the earth is searched, in vain so far, for the long-keeping apple, the pear, peach and cherry that will succeed in our continental climate with its violent extremes, we are apt to overlook the fact that we can grow with ease, in any part of the north or northwest a full supply of small fruits, which, canned by the skillful housewife, will provide all the year round a sufficiency of palatable sauces, jellies and fruit acids, so that we may need no more to eat the dried apples wherein the fly hath dwelt, or break our molars upon pebbles called currants, or lacerate our throats with the sand of the desert-prune.

The strawberry is a fruit that grows native in localities far to the north of the boundaries of Minnesota, it is proof against the freezing of winter and may be relied upon to furnish a supply of fruit annually.

True it may be said that the strawberry plant is liable to injury by the heaving of the ground under the influence of sunshine and frost, yet this does not occur unless there is thawing as well as freezing, and in northern sections there is less danger than where the winters are more open, the risk here being almost wholly in late fall and early spring. This difficulty is obviated by a thorough mulching of the plants with some loose material, such as clean straw, prairie hay, or sorghum bagasse applied as soon as the ground freezes, letting the mulch remain on the plants in the spring until the freezing weather is over, then raking the mulch into the paths between the rows.

It may also be truly said, that the strawberry is liable to injury by late frosts in

the spring; there are several ways in which to guard against danger from this cause. First, plant varieties that bloom at different seasons, then if one is taken the other will be left; second, leave the mulching over the plants until the danger seems passed; third, do not plant those varieties which have proven particularly susceptible to injury from frost; fourth, if you have done your duty in the premises as heretofore directed, and your plants are uncovered and white with bloom, and you are likely to have a sharp frost, get out all the help you can and cover the plants again with the mulch as with a blanket. The mulch may remain for two or three days without harm and the danger will be over.

I know that this will save a crop which will otherwise be destroyed, and if the winter's mulch is left in the paths between the rows, it is a short job for two or three men to cover an acre of plants. I think I am the first who called attention to this remedy, as I have never seen it in print until in the article prepared by me for the August, 1884, number of *Vick's magazine*.

There is a third difficulty to be overcome in growing strawberries, which is the drouth that sometimes arrives about fruiting time. If you have but a small bed, you can easily water it; a large plantation is much protected by the mulch between the rows and I have watered plants by the acre with a street sprinkler with much benefit. Here in the north we have some advantages. No insect enemies yet to devour the crop, and no rust, leaf blight or like objections to injure the plants; hence, we ought to do as well as growers anywhere and revel in the delight that all mortals feel when eating strawberries. If the ancients had our advantages, Homer and Virgil would never have sung of nectar and ambrosia, but Jupiter and the other gods upon Olympus would have been depicted as subsisting upon strawberries and cream, with an occasional short-cake to make the diet more substantial.

In growing strawberries, use rich soil, give good culture, grow in matted rows not too wide; hill culture is not available, plant in spring, set few varieties, grow Crescent with Finch's Prolific or Wilson for fertilizer for early; Cumberland Triumph and Miner's Prolific for medium; Manchester, Mt. Vernon or Glendale for late, and if you desire to experiment buy a dozen of some new kind and compare with any variety named and you will probably not propagate the novelty further.

RASPBERRIES.

The raspberry follows the strawberry in season and is next to it in quality. It is not so universally hardy, but some varieties are almost iron-clad. In blackcaps there seems to be two families, the one more slender in growth, ripening canes and berries early; the Doolittle and its successors Souhegan; Tyler and Ohio are of this class. The other class is larger in cane and berry, later in ripening fruit and wood and is represented by the Mammoth Cluster with numerous aliases and the Gregg. The former class maturing its growth earlier, surpasses the latter in hardiness; and being of a drooping habit can be more easily covered in localities where protection is necessary.

The red raspberries are of high flavor, and the Turner, I think, is by far the hardest and best for the north and I deem Thwack about as hardy and a better shipper, although not as fine in quality.

Cuthbert is valuable but is injured by winters like that of 1884-5.

Red raspberry plants can be easily protected by weighting the tops down and turning earth upon them with a plow.

• Set blackcaps as closely together in the row as possible, they then support each other and do not break down, about two feet apart is the proper distance. Let the red varieties make narrow hedge rows and cultivate or chop out the surplus suckers. Set raspberries in good soil, cultivate thoroughly; always have the rows run east and west; the plants are less liable to injury from our prevalent west winds; are not so much affected by dry weather, and are better covered by drifting snows in winter, than if the rows ran north and south. Do not use any stakes or trellises for raspberry plants, but pinch out the tips of the new growth of blackcaps when eighteen inches high and pinch back the young shoots of the reds, when they show above the foliage. I never protect raspberries or blackberries and have never had Turner, Thwack, Souhegan, Tyler or Ohio injured by winter; Gregg, Cuthbert and other red varieties not named were partially hurt last winter; and gave but a half crop in 1885.

In blackberries, Snyder is superior to any other variety in hardiness, and bears some berries every year, with a full crop generally in alternate seasons. Its suckers less than any other variety and hence is valuable for the garden. Taylor's Prolific is next to Snyder in hardiness and later in season, but is not as reliable.

Do not give blackberry plants any fall cultivation; after they begin to show the berries, stop cultivating until the following spring. If autumn growth is encouraged, it is tender and will not withstand the winter; let the wood ripen early and the canes are much hardier.

There is another class of small fruits which is perfectly hardy, which does not receive the attention that it deserves, viz.: the currant.

If given good soil and culture and heavily mulched during the heat of summer, a crop is almost certain.

The only enemy is the currant worm and this is easily subdued without any injury to plants or fruit by the use of powdered White Hellebore either mixed with flour or combined with water.

In varieties, use Cherry and Victoria; red kinds; White Grape and Lee's Prolific (Black,) and if you have plenty of money try Fay's Prolific, but don't be disappointed, if you find that this much lauded variety only produces currants. Gooseberries are also easily grown and require similar treatment to currants, except that they are subject to mildew in some localities, for which a mulch of soft coal ashes I have found to be the cheapest and best remedy. The American varieties are preferable to foreign kinds.

With the fact that so extensive a field is open to every one having even a small garden, can there be any excuse for not growing a sufficient supply of fruit?

The time spent by an ordinary family in grumbling about the climate and the high prices of fruits, will be sufficient, if expended in caring for a fruit garden, to give an ample allowance.

Then the luxury of fresh fruit, the aroma, the delicate flavor, of that just picked from the home garden, which has not been touched or profaned by foreign hands, is ample compensation for any extra labor, and is something that stands as a reward, not otherwise obtainable, for well doing.

Let us then unite in preaching this new Evangel, for in so doing we shall benefit the health, morals and happiness of the whole community.

Mr. Harris moved that Mr. Pearce be requested to read at this time his paper on Orchard Management.

Adopted.

Following is the paper of Mr. Pearce :

FRUIT TREES AND THEIR ADAPTATION TO SOIL.

By M. PEARCE, Minneapolis.

Growing apples in Minnesota, has been and is at the present time a difficult question to solve. To place each variety on the soil and location to which it is naturally adapted will take time and years to fully determine. The loss of fruit trees is largely due to a want of this important knowledge.

The terrible destruction of fruit trees last winter, viewed from the proper standpoint, should not prevent the re-setting of many or all of the old varieties.

It did not require inspiration or a prophetic eye to tell us, late in the fall of 1884, that most of the fruit trees were doomed. On the first of January we wrote for the winter's meeting, page 409 of the report of 1885, as follows: "The winter has been the hardest on fruit trees we have had for twelve years, and when the facts are known, a sad lamentation will be heard in the west and northwest and all parts of the country." The truth of this statement has been realized by thousands to their great loss and sorrow.

To explain why this occurred as it did and to throw what light we can on the subject we may to some extent here refer to the nature of fruit trees. It is just as essential in order to preserve the health and life of fruit trees by the storing up of food for winter's use, when the roots are not active, as it is for the ox or horse.

During the growing season all the nourishment, or food, taken up by the roots goes into growth, or fruit, except what is used to keep the trees in a normal condition. The sap cells that contain the winter's food are the completion of the season's growth. At first they contain moisture and gas, which if the fall is favorable are soon displaced with starch. By examining the twigs or new wood when this change has taken place you will find them stiff and hard and in condition for winter.

Had the latter part of the fall of 1884 been favorable for fruit trees they would not have killed. The ground was moist, with plenty of rainfall, temperature ran up for several days to sixty-five and seventy degrees, growing heat; the starch in fruit trees in all warm localities, by heat and carbon, was changed to sugar; sap, excited the roots to action, new growth commenced, the bark loosened, buds swelled, and thousands of fruit trees were in bloom on the 20th of October, not only in Minnesota, but over the whole west as well as in other parts of the country. For once in my life to grow apples in Minnesota my faith weakened; I never looked for spring in October. A severe winter followed, and the destruction of fruit trees in Minne-

sota, Iowa, Wisconsin, Illinois and other parts of the country, was far the greatest ever before known.

The record of the past winter and its disastrous results are before us, and all that intend to plant fruit trees in the future should study the subject well, it contains a volume of unwritten, useful information on horticulture that is now in the reach of every intelligent and observing mind. One of the many topics it presents for close observation, where we can learn a valuable lesson that will be useful in the future, is by examining the condition of fruit trees on all kinds of soil, location and elevation, with and without protection. During the last summer we made this a special business and found such a marked difference in the condition of the same varieties of trees, on different soils and locations, that we believe we are now able to select a soil and location on which fruit trees will not kill, taking last winter as a test to judge from. In all cases where the Wealthy came through last winter in perfect condition, there is the best assurance it will stand future test winters. In pursuing our examination of soils and locations we found hundreds of Duchess and Wealthy killed, on other soils and locations slightly injured, and on other soils and locations in perfect condition, having made a good growth and fruited last season. If certain soils and locations will preserve the good condition and life of fruit trees it should be a special duty of all apple growers to be well posted on so important a subject. Why fruit trees so often fail in Minnesota is with me a subject of much interest, and a matter of close observation for years. I am convinced that drouth and heat, at a time when they are injurious to fruit trees, is the principal cause of the destruction of our orchards.

We stated that during the growing season all nourishment went to growth, fruit and the perserving of the normal condition of the trees, against the various drying elements, heat, wind and air. In time of drouth growth ceases, the fruit drops and all nourishment is used to preserve the health and life of the trees; and if the drouth becomes severe, as it often does on some soils and locations, the leaves droop and hang motionless, as is often observed in other plants, indicating lack of mositure from the roots; and when very severe no dew falls; in such cases trees are deprived of all nourishment both from soil and air; when in such condition trees will survive but a few days, not longer perhaps than animals when deprived of feed and drink. This important fact should never be lost sight of. Trees from whatever cause deprived of their natural protection are the victims of the surrounding destroying elements.

We will now call your attention to another cause which, in our opinion, has injured and killed more fruit trees than all other causes put together. In another part of this paper we stated that when the growth of the tree is over for the season all the nourishment goes to the formation of starch, which is stored principally in the cells of the inside bark and buds. This starch is a reserve to be used when there is no action from the roots. If it was not so no deciduous tree could survive the mildest winter. They still have the same destroying elements to resist; nature has wisely provided them with the same protection when the roots are not active as when they are.

During the time the roots of the trees are not active, when the leaves are off, late in the fall and winter, the change of stored up food is more rapid at times than

others, when the temperature goes down it diminishes, when it goes up it increases, and when up to growing heat is very rapid; and if the heat continues for a length of time the whole of the stored food or starch is changed to sugar, or sap. This was the case in all warm localities in the fall of 1884 and a new growth was the natural result. In Minnesota there are but few falls when this does not occur to a greater or less extent, on all warm locations, surrounded with timber or heavy windbrakes, with trees planted close together, or in all places where the air and free circulation of the wind are obstructed.

The rapid depletion of stored up food from high temperature late in the fall is the greatest of all destroyers of fruit trees in Minnesota. Trees that ripen their wood the earliest on warm soil are most liable to be injured. The Tetofsky and Yellow Transparent are trees of this class and I have no doubt but many of the new Russian varieties would do much better further north than here, if planted on low land or on quick soil. High, cool, clay land is the best place for all fruit trees in Minnesota. Good protection should be given on the south and in no other place.

The winter of 1884 and 1885 has left sign-boards all over the west and northwest in the shape of dead apple trees; they are found on all low land, in valleys surrounded with hills, or timber, on the level prairie and many other places where the industrious grower spared neither money or labor to shut out the winds from his orchard. There are thousands of acres of land in Minnesota, on high ground, covered in many places with black oak, or Jack oak trees, or brush, too poor for the majority of farmer's to grow their wheat and corn. In such soil the Wealthy stood last winter without any injury.

Fruit trees on the north side of buildings or timber belts are seldom injured. We stated that high land, with a free circulation of cool air is the proper place for all fruit trees that are planted in Minnesota. On such a place all our leading varieties may be planted and expected to do well. But for general planting on all quick, warm soils, we should select varieties that continue longer in growing, and I know of no varieties that fills the bill better than the Wealthy, Duchess, Beeches Sweet and Whitney No. 20. The Tetofsky, Transparent and all other Russian varieties that ripen their wood very early will fail in a few years.

As we said at the start it is absolutely necessary to know the nature of the trees you plant, and plant them on the soil and location to which they are naturally adapted.

Secretary Hillman called attention to a number of fruit reports from the counties of Winona, Wabasha, Dodge, and Murray, which on motion of Mr. Cutler were ordered placed on file for publication.

FRUIT RAISING IN WINONA COUNTY.

By M. KNAPP, Winona.

Having been engaged in fruit culture for many years, I will attempt to answer some of your questions, hoping that my experience may be a help in building up a system which will materially enhance the culture of fruit in the northwest.

I am one of the first to raise strawberries for the Winona market, and have raised them continuously with varied success, having always found a ready home market until within the last ten years, since which time many have been shipped here on the Chicago & Northwestern, as well as to Minneapolis, St. Paul and Stillwater.

I plant in a rich loam with a gravelly sub-soil, and find this to be the best, though they ripen a little later than in a sandy soil. My farm is favorably located for irrigation, and formerly I irrigated the plants every year during the dryest season, allowing water to flow over the bed gently until the soil was thoroughly moistened. This would improve the size of the berry and extend the harvest; but taking the labor and everything into consideration I found there was no profit in it, and have discontinued it for some years.

Have used ashes and horse manure for fertilizers, the latter being much the better, the former seeming to promote the growth of the white clover, which soon covers the ground; the latter, however, shelters the grubworm, which is very destructive to the plant. I have had good success by turning under a rank growth of clover and, later in the season, a heavy growth of corn which had been sowed broad-cast and attained a height of four or five feet, thus making a very rich soil, and yielding several bounteous harvests.

The first variety of strawberry I raised was the Wilson's Albany, and have had them continuously since and found them to be more profitable than any other variety. Have tried the Jocunda, which did not do well in this soil, the berries growing to an enormous size, but the crop being very light. Have also tried the Charles Downing, Crescent Seedling, Manchester, and many other varieties; the Crescent being a good bearer, but if not picked every alternate day the berry will become soft and unfit for transportation. The Manchester are somewhat similar in these respects, while they hold out well for only one or two good pickings.

In regard to protection in the winter have tried various methods; among which have allowed the weeds to grow profusely so as to cover the plants at the time of early frost, but find that this gives the weeds an early start in the following spring leaving the plants weak and unproductive. Have also sown oats broadcast later in the season with the same object in view and with similar results. But have found, after many experiments, that if the bed be kept quite clear of weeds, that a light covering of loose straw, sufficiently heavy to protect the plant from the sudden and severe changes of the weather is the best.

In regard to grapes would say, that I have from three to five acres under cultivation. I started in with the Isabella and Catawba, and later with the Concord and Delaware, which have been the principal market grape. Have experimented with many different varieties, having at times from twenty to twenty-five kinds, with the following results:

The Lindley blossoms profusely but berries fall off, and if the season be moist, they will mildew.

The Agawam has a large but loose bunch, a taste disagreeable to some; strong, rank grower, ripening a little later than the Concord and subject to mildew in unfavorable seasons.

Massasoit is somewhat similar to the Lindley.

Lady, a white grape, light bearer and ripens a little later than the Hartford.

The Hartford Prolific is productive and ripens early, but the bunch is loose and the berries fall off very soon after ripening.

The Brighton, Clinton, Diana, Alvira, Iona and Martha need no special mention as none of them have proved to be what was at first claimed for them.

The Moore's Early is a rank grower, yielding a very large berry of excellent flavor, ripening rather early; light bearer.

The Janesville is very good for the early market, being a strong grower, a heavy bearer, small and compact bunches though not of rich flavor.

The Champion, the earliest grape I have, is in every respect equal to the Janesville but of a richer flavor, and will supplant the Janesville in a few years.

The standard varieties, the Delaware and Concord, are too well known to need further mention here. The Delaware have yielded poorly for the last three or four years, probably on account of the vines being too old, and the conditions being otherwise unfavorable.

For the last few years the cut-worm has done much damage on the sandy soils, destroying at least half the crop. They seem to do their work in the night, remaining carefully hidden during the daytime. Will try several experiments during the year in which I hope to destroy or stop the depredations of the worm.

The birds are also very destructive to the sweetest varieties, the robin, thrush, oriole and other small species being particularly destructive to the Delaware and the jay to the Concord. They do more damage some years than others, and one must watch them with a gun. These birds are also injurious to the red raspberries, sometimes doing considerable damage and requiring careful watching.

As to my experience with raspberries, can say that I have raised red raspberries many years with good success; have experimented with several kinds of black raspberries, and though yielding a fair crop, found it unprofitable to keep them and have not had any for several years. In all my experience with different varieties of raspberries I find that they do better with me by covering them in the winter and always feel amply repaid for my trouble.

I plant them early in the spring in a rich soil and cultivate, hoe and trim them carefully for two or three years until the bush has attained its full vigor and strength, when I cut out all superfluous canes leaving but six or eight to the bush, pinning them down and covering them with earth for the winter. Now is the best time to fertilize them which also serves as an additional covering.

I find that the Philadelphia, though yielding abundantly, ripens its fruit during a very short period, and after one or two pickings will all be gone.

The Herstine also yields quite abundantly—a very large and beautiful berry, but the crop is too uncertain as they are not hardy enough to resist our severe Minnesota winters.

Have also for years cultivated several of the common varieties, although none of them possess any great merit, they will do to supply the early market until the larger and better varieties, which ripen later, supplant them.

I have for many years cultivated the Turner and am yearly setting out additional plants at the expense of other varieties. The Turner is a rank grower, hardy and productive, the berry is large and one of the best market berries we have, though a few days later than the other varieties.

I am now experimenting with the Cuthbert, which promises to be a very good berry, in many respects equal if not superior to the Turner.

I have adopted a process of irrigation which I find very valuable; the water is handy and can be utilized with little trouble and expense.

FRUIT IN WABASHA COUNTY.

Mr. Herman Dietrele, of Wabasha, informs us that he has been experimenting with fruit for several years past with considerable success, more especially with grapes and strawberries.

Mr. Dietrele has resided in Wabasha some twenty-four years and about six years ago began the cultivation of grapes, purchasing a quantity of the Concord, Delaware and a new variety, said to be a seedling of the Concord, called Pocklington. This variety was recommended as being hardy, and the vines have made a good growth; but as it has not yet fruited he does not recommend it. He experimented with Janesville three years, but discarded it as worthless, as being of poor quality, and on account of its dropping its fruit. Martha, a white variety, has succeeded well and seems to be very hardy. He says he has had the greatest success with the Champion and Hartford, the former being fully two weeks earlier than the Concord, not so large and attractive, but producing good, solid bunches and fine table fruit; the vines were obtained in Missouri. The Hartford is very productive and early. The first crop from a single vine yielded eleven pounds of fruit. In 1883 he raised a fine crop but it was destroyed by an early frost. The past season the crop ripened well with the exception of the Delaware and the yield was very satisfactory. He obtained from Los Angeles, California, a number of plants of the Black Hamburg and a fine white grape, but found them entirely worthless in this climate.

Mr. Dietrele's experience with the Clinton is of interest. Soon after setting these vines he noticed the leaves were affected by a peculiar disease, which upon close examination he decided to be a malady known as Phylloxera. The leaves are covered with white spots which change to a flesh color and soon drop to the ground. Examination with a glass shows the cause of the disease to be that of an insect which, after destroying the leaves attacks the roots of the plants. He applied Naphthaline freely to the vines and succeeded effectually in eradicating the malady. He says he has found the culture of grapes quite remunerative.

He has been growing strawberries to some extent, the Sharpless being his favorite variety; also has Charles Downing and Miner's Prolific. The Crescent require fertilization and soon become mixed with other varieties. He favors mulching heavily with well-rotted manure; planting in rows, cultivating well, and renewing the beds once in four years.

Of raspberries he raises Philadelphia, Turner, Purple Cane and Cuthbert, the first mentioned being hardiest and best. His exposure is to the north and he does not cover the canes.

He has also grown apples to some extent, succeeding best with Duchess and Wealthy, for standard fruit and the Orange Crab, as a hybrid variety. Other varieties of crabs he considers of little value on account of blight. He has a large grove of native plums which bear bountiful crops of fruit.

REPORT FROM DODGE COUNTY.

By W. F. HILLMAN, Kasson.

In answer to your inquiries, I would say in the first place, that I am not a horticulturist, but was a half-farmer once.

Years ago I believe there were two nurseries in this county, one located near Kasson, since removed, and one near Concord village. Some five years since I bought the last apple trees from the Concord nursery that the proprietor could sell (I do not think of his name) before shipping to Dakota, and most of the trees that I bought and took good care of have since died. There is no telling when another nursery will be established in Dodge County.

For a small county—eighteen miles east and west, twenty-four north and south—Dodge County furnishes quite a variation, either in respect to conditions favorable to fruit culture or general farming. The northern portion was largely occupied with heavy timber, and consequently has a dry, rich soil. It was settled at an early date in the history of this State, partly owing no doubt, to its nearness to the Mississippi River markets before the building of railroads, and has been and will no doubt continue to be thickly settled. These and other conditions render this portion of the county much preferable to the southern and southwestern portion of the county, which is more level, wet and bleak, and is not so well adapted to fruit raising.

I need not inform you that though Minnesota can never rank with California or Michigan in fruit raising, on account of less favorable climate, yet there are hardy varieties of apples which will succeed well with us, especially crab apples, some of which almost rival the standard sorts in flavor and other good qualities, together with almost all kinds of small fruits, such as strawberries, raspberries, currants, and the like. The early settlers have given too little attention to these things, for it is well known that we can produce both fruits and vegetables here of more delicious qualities than the corresponding sorts can be grown in a southern climate. The finest fruits can be produced here which the market affords. No doubt horticulture will be developed within a few years to come to an extent that will surprise all but the most sanguine.

Home grown apples have been selling in our local markets at \$1 per bushel for Duchess and seventy-five cents for crabs. But when standard winter apples can be brought from Michigan by the carload and retailed at \$2.50 per barrel, as is the case in our county this year, our farmers of only average intelligence will conclude with respect to fruit raising, that they can get such apples cheaper for years to come by purchasing than by raising them. Where one farmer is too lazy to succeed at anything, (and such cases are not rare,) ten farmers try to cultivate too many acres, or they are too negligent or ignorant, in that particular respect, to reasonably expect much success in horticultural operations.

John Clark, Kasson, is a successful raiser of raspberries for the local markets. A. P. Rose, Mantorville, always has a number one garden and is a good authority on strawberries. Hon. E. W. Westcott, West Concord, is also a successful horticulturist.

FRUIT REPORT FROM MURRAY COUNTY.

By O. F. NORWOOD, Balaton.

There are probably not over two hundred apple trees in this county, exclusive of the crabs that have come into bearing as yet; but those that are old enough bore a good crop, especially Duchess and Wealthy. Not many of the latter bearing yet.

The Transcendent with us have borne a good crop the last three years. Trees of this variety, fifteen years old, have shown no blight here yet.

Raspberries a good crop though a little under average size. This was probably caused by lack of moisture, no rain having fallen for three weeks previous to the ripening of the crop.

The Gregg, we think a splendid raspberry for this country. This and Turner about equally hardy with us; both have stood the winters without protection, except last winter they suffered slightly. Souhegan not hardy.

Red currants were a good crop, but not as good as in 1884.

Gooseberries, (Downings,) have generally been plenty, but this year the bushes were infested with worms, nearly an inch long and resembling the cabbage worm. These pests made their appearance here this year for the first time, but in several places, and there was very little fruit.

Native plums planted in the garden were loaded with fruit, and with proper care they are a fair crop most every year.

Strawberries, a big crop, especially Crescents.

Grapes: we have fruited only the Concord and Clinton. Concord a small crop and of poor quality; the two previous years we had a nice show of fruit on these vines. Had a fair crop from the Clinton. We think we gave the Concord vines insufficient covering, which was the cause of failure this year.

I have made inquiries throughout this county and find no injury to apple trees from the severe weather of last winter, which is encouraging to us here, when we consider the damage done to orchards in other parts of the State more favorably located than ours.

The following paper was then read by J. T. Grimes.

CONIFEROUS TREES OF THE ROCKY MOUNTAINS.

THEIR VALUE AND ADAPTATION TO THE TREELESS PRAIRIES OF THE NORTHWEST.

By D. S. GRIMES, Denver, Col.

For stately grandeur in form, and beauty in color, the Evergreens of the Rocky Mountains are unsurpassed and stand as worthy companions in landscape pictures to the grand scenic surroundings of their Alpine nativity; the canons and lofty snow-clad peaks of the Great Continental divide—the Switzerland of America.

The natural beauty, symmetrical form, location in altitude and in latitude, together with the conditions prerequisite for extreme hardiness, and the rapidity of growth of some of the most desirable varieties, pre-eminently fit them to grace the lawns of refined homes, and especially for wind breaks and timber culture, should receive a hearty recognition.

From my long residence in Colorado and extensive knowledge of the Rocky

Mountain forests and from observation and practical experience with the Conifers of this elevated region, am fully convinced that the varieties of evergreens best suited to endure the climatic conditions of the arid plains and prairies of the new west, must come from the Rocky Mountains. From experience we find they readily adapt themselves to the greatest extremes of atmospheric changes wherever introduced.

The intelligent and progressive people of Minnesota, as well as those of her sister prairie states, must admit that the most effectual and durable barrier against the storms that sweep over the country will be found in extensive tree planting. But the planting of trees for shelter and wind breaks is but a small part of the value of such work.

It is a singular fact that while the lumber commerce of the world is largely supplied from coniferous forests, aside from our parks and lawns, very little attention or importance is attached to the planting and cultivation of this valuable class of trees.

In this progressive age of prairie settling where homes are to be made, the planting of suitable varieties of coniferous trees for timber and shelter should be encouraged as a matter of the first importance.

Failure in successfully growing evergreens, often has its origin in the adaptation of varieties and for local causes of which the atmosphere is one of the most important.

On account of the aridity of the air both summer and winter, the Missouri slope west of Kansas City and north of Omaha is not adapted to the class of evergreens commonly planted in a more humid climate farther east.

On the other hand, the natural aridity of the atmosphere and the extreme degrees of cold that frequently sweep over the Rocky Mountains, have created varieties of forest trees suitable by acclimation and adaptation to a wide expanse of country extending as far east as this peculiar influence exists.

Not only are the Rocky Mountain Conifera well adapted to these arid and arctic influences which characterize their native surroundings, but in the moist atmosphere of the Atlantic coast and in Europe they seem to flourish with equal health and vigor.

Of the score or more varieties of evergreens seen growing in various localities on the Rocky Mountains we call attention to only a few of the most beautiful and valuable; introducing in their behalf the testimony of men well and favorably known in horticultural pursuits.

The *Abies Douglasii* (Douglas Spruce) heads the list as the coming evergreen for the prairies. Rapid in growth, beautiful in form and color, wood durable and valuable, its soft foliage and flexible branches enabling the tree to safely resist a heavy weight of snow or strong wind. By judicious pruning and clipping, they can be made to grow in any form desired and are equally well adapted for ornament and usefulness.

Downing says in his description of the pinetum at Dropmore: "Perhaps the finest tree in this extensive collection is the Douglas Spruce. It is sixty-two feet high, and has grown to this altitude in twenty-one years from seed. It resembles most the Norway Spruce, as one occasionally sees the finest form of that tree, having that graceful downward sweep of the branches, and feathering out quite down to

the turf, but it is altogether more airy in form, and of a richer and darker green color. At this size it is the symbol of stately elegance." The late Prof. F. B. Hough, Chief of Forestry Division, United States Department of Agriculture says: "The Douglas Fir (*Abies Douglasii*) is incomparably the finest of the firs, surpassing them all in size and equalling the best in value as a timber tree, and is found to withstand the drouth better than most conifers, while it equals or surpasses most of them in growth." Thomas Meehan in his valuable "Gardener's Monthly" in speaking of it, says: "Raised from Colorado seed, this fine tree has proved itself perfectly hardy in the very low temperature and severe winds of the north-western prairies, and in eastern Massachusetts where it has stood entirely uninjured during the last sixteen years, although plants raised from seed from the Pacific coast are quite tender and unable to endure our winters." Robert Douglas of Waukegan, Ill., the most extensive grower of evergreens in the world, having fully tested seeds planted in his grounds from California and Colorado, says that "trees from seed collected in California proved not hardy, while trees produced from seed of the same species, collected by Prof. Parry, from trees on the Rocky Mountains in Colorado, were perfectly hardy."

Abies Menziesii.—According to De Engleman, the Colorado *Menziesii* is *Picea Pungens*, and not the *Menziesii* of California. This tree commonly called the "Blue" or "Silver spruce" of the Rocky Mountains, must be seen to fully appreciate its faultless beauty. They are, however, rare, and seldom met with. They are found growing at from 7,500 to 9,000 feet altitude, in rich, moist, alluvial soil, at the foot of the mountain, near a stream of water. On account of their peculiar glaucous color and symmetrical form, they are much sought for. In Denver they take the lead of all others. Referring again to the "Gardener's Monthly" Mr. Meehan says, "It was a good winter (1879) to test the point made by Professor Sargent that *Abies Menziesii* of Colorado is much better adapted to endure eastern winters than a *Menziesii* of the Pacific coast. We (Meehan) examined recently some specimens in Germantown that had been through the winter side by side, and found all the Pacific plants with their leaves off, while the Colorado specimens had not a leaf injured."

The Colorado form is known in nurseries as *Abies Menziesii* Parryana, we suppose named in honor of Dr. Parry the celebrated American botanist, who years ago collected and distributed to professional growers seeds of the Rocky Mountain Conifer." This species, says Thomas Meehan, has been tested at various times on our northwestern prairies, enduring a temperature of 30° below zero without injury, and also very extensively near Boston where it has stood out entirely uninjured during the last sixteen years. This is not only one of the hardiest, but the most beautiful of all spruces.

In April 1860, John F. Baldwin of Olney, Iowa, dug some *Menzis spruce* out of the snow up on the Rocky Mountains. When dug they were less than two feet high. They were packed in hay, nothing better to be obtained and hauled across the plains in a wagon to Iowa, being over a month on the way. In Mr. Baldwin's report to Prof. Sargent in 1880 he says, "these trees are now twenty-five feet high, and are very hardy, having withstood the most severe winters without being the least killed back."

He considers them as hardy and beautiful as any tree found in the country.

About seven miles north of Oceola, Iowa, are seen two beautiful specimens of the Blue Spruce. These trees were also brought in a wagon all the way from Pike's Peak by a gold mining adventurer in 1860. The man becoming tired of hauling them, sold out to a farmer who succeeded in raising two of them. In planting, a quantity of stones was mixed with the soil around one of them. This tree had made double the growth of the other.

The Pungens or Blue Spruce in Colorado shows a marked tendency to *sport*, both in the color of the leaves and the growing habit of the lateral branches. While the foliage of some trees exhibit a full, rich, glaucous blue, both above and below, making them conspicuous objects as far as the tree can be seen, others in the same group, take on different degrees of color, from a tinge of silvery blue above, to a dark green beneath. The natural order of the branches are rigid and fan-shaped, drooping in regular folds one above the other. But in many trees of mature growth are seen great numbers of flexible branches from six inches to a foot in length, hanging pendulant from beneath these folds, waving with the least bit of air that stirs.

This peculiar weeping habit contrasting so strangely with the general stiff and stationary character of the tree, does not appear in younger trees, neither is it confined to any shade of color in the foliage. So regular is the arrangement of the over-lapping branches of this rare and beautiful Spruce, that often times when caught in drenching showers of rain, we have found secure shelter under the "blue forest banners of the Rockies." In point of stately elegance and grandeur it stands a fitting representative and often reaches a height of eighty feet. The cones are borne sparingly on the side branches, but on the top or apex, they cluster in such quantities as to almost hide the leaves, where they hang pendulant for two years.

This head decoration of light-brown cones covering a few feet only of the extreme top, makes a fine setting off to the gay colors below.

As a hardy, rapid growing ornamental evergreen, the Blue Spruce of Colorado has no superior.

Abies Englemann. (Engleman Spruce)

In hardness, this Spruce is a true "iron-clad," having withstood the severe climate of St. Petersburg, Russia. It is also a tree of high altitudes, growing up to "timber line" on northern exposures. The best specimens however, are found at an elevation of about 9,000 feet, along side *Picea Pungens* and *Abies Grandis*. The leaves are short and thickly set on slender branches, of a dark-green color, with a small stripe of white above and below.

These lines of white stomata are not so plain in a specimen seedling grown and sent us by Robert Douglas, as they are generally seen in their natural habitation on the mountains. This apparent difference may be caused more from altitude and climate than from any difference in species.

All trees and plants found growing in Colorado exhibit a much lighter color in leaf and bark, than the same varieties grown in lower altitudes.

The wood of the Engleman Spruce is soft, white and valuable for timber, and for ornamental purposes, we place it in the front as a companion picture beside the *Menziesii*.

Abies Grandis (Great Silver Fir). Of all the new and rare conifer that it has been

our pleasure to test, not one excels this in our estimation. We have grown it in the open air for ten years, and entirely unprotected, it has withstood the most severe cold and intense heat with equal unvarying success.

"Our oldest specimen is the admiration of everyone who sees it, and is a living proof of its availability to our cultivators in the Middle States. As to protection during the winter it has not needed the slightest." (Hoop's Book of Evergreens.)

For stately grandeur and form of growth the *Abies Grandis*, as we see it in its Sub-Alpine to Alpine home on the great Continental Divide of the Rocky Mountains, is the true ornamental type of a perfect tree. Erect, straight and smooth as an arrow; leaves silvery green; branches fan-shaped, spreading in regular folds or layers one above the other; the lower branches pendulant the upper ones ascending, the wood soft and white and free from resin.

The appearance of the Great Silver Fir, with its flexible branches gracefully waving in the breeze, forms a marked contrast with its rigid, natural neighbor, *Pinus Pondulosa*.

This species of evergreen seems to thrive best in a cool, moist, rich, porous soil.

In many instances we observed, where the lower branches had been pressed to the ground by the heavy weight of snow, they had taken root and formed new trees, a la Bunyan. From this we infer that propagation from layers and cuttings would be easy.

Although Nuttall, Douglas and other celebrated botanists, have located this exceedingly lovely tree on the Pacific coast, from Northern California to British America, and we too have seen large forests of it, on Mount Ranier near Puget Sound. We have also found it growing on the head waters of Boulder Creek, near Cariboo and even up to timber line, at 12,000 feet above the sea—an altitude higher than most of the clouds that float over the Eastern States.

PINES.

Pinus Contorti—Twisted branched Pine.

Contrary to what the name would seem to imply the *Contorti* is a slender, straight, rapid growing tree. The branches are numerous, slender, twisted, thickly covered with leaves, two inches long and two in a sheath. The color of the leaves is a pale green, rather pleasing to the eye.

As an ornamental tree it is quite pretty when small, but in its natural element, inclined to grow tall and slender. The wood is white, light and strong.

The first settlers of Colorado fenced their farms with the poles and built their cabins from the larger trees. They are found growing thickly on northern exposures along the mountain slopes and extending up to the highest elevations.

While this species of pine is of but little value for lumber, it is valuable for railroad ties, telegraph poles and mining timbers.

Pinus Pondulosa—heavy wooded pine.

The leaves of this Pine are a very dark green, nine to ten inches in length; three in a sheath.

The branches of *P. Pondulosa* are more open and scattering than the *P. Contorti*, yet as an ornamental tree, especially in a collection where the brightest and deepest shades of color are artistically arranged in landscape architecture this tree would

fill an important place. It is as hardy as any tree that grows, and for lumber the most valuable pine found growing on the Rocky Mountains. The timber is heavy and durable, and not liable to warp.

Extensive forests of this valuable timber commonly called Yellow pine in Colorado, are found growing from 8,000 to 10,000 feet altitude, on dry elevated table lands, that are common to those higher mountain regions.

Prof. H. W. Sargent in his supplement to "Downing's Landscape Gardening," speaking of the *P. Pondurosa* says: "It is the hardiest of all pines, not excepting our native White pine, and the fastest grower. We have a tree eighteen feet high, raised from the seed in seven years; gigantic in every sense of the word. The new shoots are two or three times as thick as those of the white pine and the same with the buds. The annual growth of the leading shoots, exceed a yard in length."

Our experience with this pine in the Denver Nurseries fully corroborates Prof. Sargent's record. Not only is it a rapid grower but the wood is durable. We know of posts planted in Colorado soil twenty years ago, apparently as sound as when first set in the ground.

In their native mountain forests, where the seeds have dropped along those old abandoned trails or road ways, or in anyway are covered, even with the poorest soil, leaves, or stone, they germinate and throw up a rapid growth. Where a fast growing and valuable variety of timber is the object desired in timber culture, we know of no tree so well suited to the Northwest as this heavy wooded pine of the Rocky Mountains.

Before concluding our remarks on this interesting and valuable class of trees, we think our work would be incomplete, without adding the testimony of the late lamented Dr. John A. Warder in one of his valuable papers on forestry, written during his official term as President of the American Forestry Association.

He says: "The spruces of the Rocky Mountains though still comparatively rare deserve a share of your attention, especially the *Picea Pungens* formerly called the *P. Menziesii*, the silver spruce of those mountains; the *Picea Englemanni* and the *Abies Douglassii*."

All these trees are very beautiful; but you must be warned not to import them from Europe. Look to the Rocky Mountains themselves and not to the Pacific Coast as the original supply of these trees.

Mr. Cutler presented the following paper:

NOTES ON FORESTRY.

By M. CUTLER, Sumter.

Mr. President, Ladies and Gentlemen:—

The subject of forestry is one which I feel myself incompetent to properly handle. It is one demanding the greatest consideration by the people and law-makers of our whole country. Our noble forests are rapidly passing away before the merciless power of the axman's hand. And where, in the memory of the writer, a large part of Western New York was covered with the monarchs of the forest, to-day it is nearly as barren as the prairies of the west. Drouths and floods are of common occurrence, fences have nearly disappeared, and most of the fuel supply is obtained from the coal mines of Pennsylvania.

But this destruction is not confined to the east; fifteen years ago the country from Lake Calhoun to Glencoe was an almost unbroken forest. To-day, the whole surface is dotted with farm houses and clearings.

When I came to Glencoe the prairie west of there seemed a dreary waste, with here and there a solitary house, looming up against the horizon, like a ship at sea. The wild deer roamed over the prairie and through the forest. One small cottonwood grove at New Auburn was the only one in sight. The wonderful change that has been wrought is best illustrated by the exclamation of an acquaintance, when, on a beautiful May morning, he says: "Where will you find a more beautiful land than this? Whichever way the eyes turn, beautiful groves and nice farms are seen." This fact slightly compensates for the destruction that has taken place; but there has not been a tree set where there should have been a hundred.

If there is one place more than another where the benefit of tree-planting is felt, it is on the prairie west of the Big Woods. As the oasis to the weary, hungry and thirsty traveller on the sands of Sahara, or the harbor to the tempest-tossed mariner, so is the grove of cottonwood and willow to the dweller on the prairie. He knows that although the winds may howl and blow at the rate of sixty miles an hour, peace and quiet reign in its shelter. Methinks that if one of our prominent members, who states in a recent number of Farm, Stock and Home that the cottonwood and willow were not worth mentioning, and who expressed his surprise that farmers continued to plant them, recommending larch and maple instead, was to stand on the west side of a grove of these despised trees, with the wind blowing a gale and the thermometer at forty degrees below, he would hasten to their shelter and exclaim with Brother Sias, "God bless the cottonwood and willow."

Most of our farmers are poor when they settle on the prairies, often many miles from timber; maple and larch trees cost money, while cuttings of the others may be had for the asking. Again, the rapid growth of these afford shelter and protection before the others hardly commence to grow. But think not that I have aught to say against the larch and maple; the first has been my admiration from youth up, owing to its tall and graceful form. It reminds me of the days of 1860, when the tallest specimen in my father's swamp, in connection with a noble white ash furnished by one of our neighbors, was made to bear the name of Lincoln, and helped to kindle the fires of patriotism in the hearts of the people. That this variety will succeed on our prairie soil has been proven by my neighbors, who have fine specimens growing in their yards.

In connection with the trees named I would recommend planting different kinds of walnuts for nuts and timber. The importance of forest trees to the man that has the courage to attempt the growing of fruit on our prairies was fully demonstrated last spring. Small fruits on the east side of groves being in good condition while those on the west side, exposed to the winds, were badly injured.

And now fellow members let us by example and word in every possible way encourage the planting of forest and ornamental trees, knowing that although we may not reap the full benefit, our children will bless us for so doing.

Let us together take our stand,
To stay the wily axman's hand,
And make of this a fertile land
Instead of one of drifting sand.

The following paper was placed on file for publication :

THE TRANSCENDENT CRAB.

By C. L. SMITH, Minneapolis.

After twenty-five years of trial in Minnesota, the season of 1885 found the Transcendent ahead of all other sorts in the State. There was probably a hundred times as many Transcendents grown in the State the past year as of any other variety. Each year some new variety is brought out as better than the Transcendent, but somehow these never find their way into market. At Glencoe, last fall, I saw the Transcendents brought into the market by the wagon load; there were also a very few bushels of Duchess, but very few of anything else. Now the farmers in that vicinity have undoubtedly paid out dollars for other varieties where they have cents for Transcendents. I look forward to the time when our markets shall be filled with choice apples and pears grown in our State, but until our experimental stations and professional horticulturists can show a better record than at present, would it not be good policy for every farmer in the State, who has not already got them, to plant out at least a dozen Transcendents. I know they sometimes blight, but, on the whole, they have proven the best of anything we have yet found. The fruit is not equal to the Wealthy or Autumn Strawberry, but they are, oh! so much better than nothing. I would not advise anybody to stop with the Transcendent for I have hopes of something better, but I would advise every planter to begin with Transcendents, and take care of them until they have something better. The extreme hardness of the tree, the readiness with which it recovers from an injury, makes it a very desirable tree for the farmer to plant. The ready market and good prices found for the fruit in the towns of western Minnesota and Dakota, shows that there are many people living there who have an appetite for it.

Any surplus fruit will find a ready and profitable market for years to come. For canning it is very fine; dried it makes good pies or sauce; it also makes an excellent apple butter.

Still striving for something more excellent let us give a little more care and attention to this much abused and slighted fruit. It passed through the severe winter of 1884—5 almost unscathed; it can be profitably grown on any farm in the State, and every farmer ought to raise all that his family can use.

What a pity some of the farmers who have neither strawberries, raspberries, currants or grapes, could not have had the good sense to invest in Transcendents at twenty or twenty-five cents each, instead of Fameuse, Northern Spy and Maiden Blush, budded on "French crab stock, at only a dollar, a piece." There is no humbug about the Transcendent, therefore few farmers want to buy it, and few slick talkers are trying to sell it.

Mr. Smith announced that the next annual meeting of the State Forestry Association would be held at the State University commencing the third Tuesday in March, and invited the members of the Society to be present at the meeting, so far as possible.

HORTICULTURE ON THE STATE UNIVERSITY FARM.*

By PROF. EDWARD D. PORTER, Minneapolis.

Mr. President and Gentlemen of the Horticultural Society:

Before beginning my remarks upon the department of horticulture at the University Farm, perhaps it might not be out of place to give a short outline of the University in all its branches, and that necessitates a brief review of its organization and work.

The University of Minnesota, like every other institution that aspires to be a university in fact as well as in name, is made up of a group of colleges or separate institutions, each having a specified object, each distinct from the other, but all arranged under one general management, and collectively known as the University of Minnesota. In its ultimate design, it embraces the departments of literature, science, the arts, law, medicine, theology and agriculture. Our State is new, its institutions are all in a formative condition. It was impossible in this State to create at once an agricultural college fully equipped, law and medical colleges, and all the other departments of a complete university, and have them spring forth perfect and complete like Minerva from the head of Jove, but the development must necessarily be slow and gradual. The finances of the State of Minnesota, and the wants of the State did not warrant the establishment of all these different departments at once. The Board of Regents wisely began at the foundation, and organized the academic department, commencing with what might be termed a high school. This was the nucleus around which in time they hoped to build up as grand a university as any in the land. After this came the establishment of the classical department, then came the departments of literature and science, and these came along, one following the other so rapidly that in the course of five years the full organization of an ordinary college was obtained. This work was carried on step by step, keeping distinctly in view the ultimate organization of a complete university. At a very early stage in the organization of the university, it became necessary, in order to meet the demands of the farmers of the State, and in accordance with the provision of appropriating public lands for the organization of a college of agriculture and the mechanic arts, the act of congress, to organize the college of agriculture, but I may say that the organization of this college was in advance of public sentiment and demands. The people of the country did not require it, because they had not been educated to see the necessity of it, but its organization was forced, and like all hot-bed growths, the progress has been slower than it should be and would be, were the conditions more favorable. But the college of agriculture of the State of Minnesota was established as contemplated by the act of congress, and was organized by the Board of Regents as authorized by the legislature of the State.

This college of agriculture is made up of two departments, in reality; the theoretical and the practical. Agriculture, for its successful prosecution and in its scientific researches, makes demands upon every department of human knowledge. There is no trade, business or occupation followed by the human race that

*The address of Prof. Porter was delivered extemporaneously before the Society on Thursday afternoon, and appears at this place on account of a delay in returning the manuscript to the Secretary, after its revision.

requires as well disciplined, as well cultivated a mind, as the prosecution of agriculture. I know that is contrary to the generally received idea, that if there was a dull, stupid boy in the family, all he was good for was to make a farmer, but if there was a bright boy you must make him a lawyer. But I make the statement without fear of contradiction, that it requires ten-fold more brains and more education and more skill to make a successful farmer than it does to make a lawyer, physician, clergyman or merchant.

I don't know of a department of labor that demands more diversified information than agriculture. The farmer must not only have a thorough knowledge of the work in itself, he should also understand the underlying principles upon which his labor is based. There is not a single field of human knowledge from which agriculture does not demand a contribution.

Let us see in what respect this applies to the farmers of Minnesota. In the first place, for a successful prosecution of his business and calling, the farmer should be familiar with the soil; its cultivation is one of his labors, and it is utterly impossible for him to become acquainted with its characteristics, composition and requirements, its adaptability to one kind of fruit or another, to grains, vegetables or stock, without first becoming familiar with the principles of chemistry, mineralogy and geology.

Has the University of Minnesota made any provision for the student in these departments?—It has the finest geological museum in the northwest; its chemical laboratory is fully equipped with the most improved and complete apparatus, and is under the charge of a competent corps of professors. There is most ample provision for instruction in all these departments.

The intelligent farmer should possess a thorough knowledge of plants—their structure, both general and minute,—their habits, adaptability to varied soils, methods of germination, growth and fruiting, and their relative economic value. The science of botany is peculiarly necessary to the agriculturist, and in how far can the University supply this need? It has a laboratory wherein each student uses his own compound microscope, and with his eyes corroborates what he learns in his text books; he sees the cells of the plant, their arrangement into various tissues, their different uses in the several parts—leaf, stem and root. He examines also the fungus growths which prey on our field crops—becomes familiar with the methods of the potato fungus, the ergot of wheat and rye, the corn smut, etc. He is enabled thus to study and investigate the whole realm of plant life from the minute bacteria to the fruiting apple tree.

In other departments of science he obtains facts equally valuable and necessary, for the farmer must learn the laws of the elements that are continually at work, modifying and controlling the things with which he labors. He should familiarize himself with the effects of light and heat and electricity, of storms, ice and snow, of heat and cold, and in all these branches of learning the University offers him great advantages both as to excellent apparatus and skilled instructors. There are between twenty and thirty professors who are men devoted to their specialities, and they offer the amplest provision for the investigation of these necessary adjuncts to farming.

So much in general for the equipment of the University. Now as to what provision is made for the Department of Agriculture. The student who comes to the

University of Minnesota enters his name in the department he prefers. If he enters the school of agriculture he will go into the classes of physics, botany, chemistry, etc., with all the others, whether in the classical, scientific or his own department. All the students receive the same advantages. If the boy wants to study civil engineering he goes into the classes in mathematics with all the others. In this way economy in teaching is secured, the work being accomplished thus instead of having, for instance, as many professors in mathematics as there are departments. Of course one man can just as well instruct fifty students as five.

The specific work belonging to the Department of Agriculture is divided into two parts, the theoretical and the practical.

When I took charge of this department of the State University, and looked over the field, I found not only in Minnesota but in many other states of the union, the appliances were furnished, but the boys to avail themselves of the appliances were not there. Minnesota is not alone in this respect. Yale College that has an organization of over a hundred years, and has sent out its graduates all over the face of the earth, with its splendid equipment and provision for collegiate instruction, has graduated but six students in agriculture since 1864; but while the University of Minnesota has not a very large class of young men that have enrolled their names in the college of agriculture, among the 300 or more students in the university, over one-half come from the farm, and it is the farmers' sons and the farmers' daughters who are receiving the benefits of this institution.

Upon taking charge of the department of agriculture, I found one of the very first things necessary was to furnish the means for giving students a practical knowledge of agriculture in all its branches, and that is the work that has occupied my time and attention for the past four years. The methods of instruction in all departments have materially changed within the past half century. For instance, in the department of chemistry, look what a wonderful change has been wrought in every detail. I can remember hearing my father say that all the chemistry he got in his college course was from a few pages in the back part of the old treatises on natural philosophy; he never saw a single quart of oxygen or hydrogen made. After studying chemistry in that way, a student knew nothing about it; even when I had my first lessons in that science I remember very little of it except sitting thirty feet away from the laboratory table, and seeing the professor perform these experiments. That is all we got of chemistry twenty-five or thirty years ago. Now, the student enters the laboratory, performs all these experiments with the elements, and then compounds, etc., and becomes thoroughly familiar with every detail of the laboratory. Now, there isn't a well organized institution in the United States that pretends to teach chemistry in any other way. At the University practical chemistry is taught in this manner. Every student is obliged to take up the analysis of compounds, and thoroughly familiarize himself with every element and with all the details of every experiment, so that when he has got through he knows something about it. That is the mode of teaching chemistry to-day. It is educating the mind and educating the hand and developing his powers of observation, and calling out his judgment; it is educating, it isn't stuffing. The same method is adopted in the department of engineering.

The science of engineering is taught by familiarizing the student with the workshop and the field. He selects his materials, puts up the structure, runs his line of

railroad, and makes his computations of elevation, embankment, masonry and superstructure, as though in actual construction, so that when he leaves the school he is prepared to enter upon the practice of his profession.

Our object is to make this farm the work-shop of the College of Agriculture, and to give a practical illustration of the subjects taught in the class-room, such as the student of chemistry may get in the laboratory, so that when we talk about soils and the adaptability of certain crops to particular soils, the student comes out there and sees a practical illustration under his own eye. He has read about clay and sand and loam, and his season's work on the farm with their soils makes him practically familiar with their properties. This method of reaching these practical results is going to be of great service to the agriculture of this State; but we haven't the number of students that the State should send us; we are ready to furnish the instruction and the appliances if you will only furnish the boys.

On the first day of May we expect the students in our department to come out to the farm, and we will give them good, comfortable quarters, plenty to eat and plenty to drink, and a plenty to do. At five o'clock the bell will ring for them to get up, dress, feed the stock, clean the stables, harness the horses and milk the cows; at half-past six breakfast is ready; at seven every man and every team is ready for the field. There are no books except for reference and recreation. The text-books have all been left down at the University.

The student wants his dinner, I claim, about twelve o'clock; it will take him fifteen minutes to get into the house, take off his soiled overalls, put on something else and get ready for dinner; the dinner bell will ring at a quarter after twelve, and the boy will go to work at one o'clock. We stop work in the summer at six; have supper a quarter past six. That has been our custom for two years past. On the first day of October his work ceases at the farm. After that date we do not expect him to do any more work in the field that year. The young man lays down the shovel and the hoe and takes off his cowhide boots and puts on his dress suit, and he goes into the class-room of the university. He is now a theoretical student. There he will have access to the laboratory, the work-shop and foundry, the museum and libraries, and receive instruction from a corps of instructors who will endeavor to do their duty and give him all the theoretical knowledge that is possible, and in the spring he will be ready to go back and take a dose of the practical again.

How are we going to train students in practical horticulture? Well, when the students come to the farm I propose to place one band in the horticultural work, and I expect to familiarize them with all the details of planting, care and cultivation that can be given in the line of horticulture; others will learn how to clean the stables, how to feed the horses, put the harness on, and know when the horse is harnessed rightly, and taught the use and care of farm implements and farm machinery. Another set of these boys will be detailed to stock farming; they will milk the cows, take care of the milk, clean the animals and take care of the stables and be made acquainted with the breeding and rearing of all kinds of domestic animals. In that way each one will be familiarized with all the details of every department of farm work; they will be changed off from one kind of work to another so that in the course of the season the young man will have a thorough drilling under the best instructed in all departments.

We expect to grow on that farm every variety of fruit and flower and grain and

grass, that can be grown in the soil and climate of Minnesota, and all the breeds of domestic animals of value to our State. That is what we expect to do. In many lines of work we have already made a beginning. I suppose you remember the fine exhibit Minnesota made at New Orleans, at the World's Exposition.

I may state that nineteen-twentieths of that agricultural exhibit was raised on the experimental farm, and every single article that was put on exhibition at the last State fair under my charge was raised on that farm, and its exhibit there of grain, grasses and vegetables I can duplicate fifty times to-day by going to the stacks and bins and taking it out; so that we congratulate ourselves that we are doing some work in that line.

Now you ask what are we doing for Horticulture on the Experimental Farm? We have made a beginning.

Our vineyard is planted on a hillside with an eastern exposure. It contains the following varieties:

Agawam, Brighton, Concord, Delaware, Empire State, Goethe, Hartford Prolific, Iona, Ive's Seedling, Janesville, Lady, Lindley, Martha, Merrimac, Moore's Early, Niagara, Pocklington, Prentiss, Salem, Wilder, Worden. Of these the Niagara and Empire State were planted last year. The Niagara made splendid canes. Of the Empire State but six lived of the ten set. Excepting the Concord, there were but ten vines planted of each variety, the object being to test their relative merits, under identical conditions of exposure, soil, culture and pruning. All have grown well but Iona—which has been discarded. A little fruit has been borne the past season, but next year will bring, I hope, a good crop.

With apples a fair start has been made. I have been in correspondence with Prof. Budd ever since his return from Russia and learned from him the best results of his work. You know that the object of Prof. Budd and Mr. Gibb in going to Russia was not alone to secure new varieties. Their primary motive was to correct the nomenclature of the Washington importations—these had been received from many sources and had been duplicated under different names; the whole list was in confusion, and the visit of these distinguished horticulturists has resulted in a thorough revision and correction of that tangled work.

Their visit was of great value also in determining the behavior of these trees in their own home; not among the least of its results, let us hope, was the additional varieties they discovered and imported.

Besides fifty-eight varieties, one, and small two-year old trees, I secured from Professor Budd almost an entire duplicate of his extensive collection of Russian apples, numbering about two hundred and twenty-five varieties. These latter were grafts made late in March, from cions that were cut from the trees at the time the grafts were made. That is to say, we found in Prof. Budd's collection about 225 varieties that, after the severe winter of 1884-5, and after being grafted so late as the last days of March, were yet of such vitality that but one variety in the whole list was lost—and of that variety but three grafts were secured. This we regarded as a remarkable indication of hardiness. From three to one hundred grafts were obtained of each variety—averaging not more than twenty of a kind. These were planted in a sheltered situation and given thorough cultivation till about the middle of July, after which they received no cultivation save an occasional "scalping" of winds.

For the experimental orchard, however, I chose the most open situation and what I regard as the most difficult place for tree growth on the farm. It is our intention to test these varieties thoroughly, and I feel confident that the trees that survive five winters in our exposed experimental orchard, can be relied upon for all Minnesota points of equal latitude. For comparison of hardiness, I planted two rows of Duchess in the same orchard. All received moderate cultivation, the twenty-four feet space being planted with potatoes, and only two trees of the two hundred planted died; the others made a good growth. You will doubtless remember, however, that the latter part of the summer was excellent growing weather, so that, despite lack of cultivation at that time, the trees continued to grow, instead of preparing for winter, hence many of them went into winter quarters with soft shoots, and these will probably suffer. As rapidly as any trees in the orchard die, their places will be filled with other varieties from the nursery, and thus I hope soon to thin out the weaklings and present to you a list of the fittest, which will survive.

The orchard is planted twenty-four feet each way; such of the Russians as they continue to grow shall have ample room to reach their full development.

I also received from Prof. Budd nine varieties of Russian pears, all of which were set in orchard, part in the experimental orchard, and the others in the more sheltered fruiting orchard, which consists of well known varieties of plums, apples and crabs, planted on a northeast slope, in new timber soil.

There are also on the farm a number of young conifers and deciduous timber trees. Seedlings secured from Robt. Douglas & Co., of Illinois last spring. These have in the main, done well. On account of the great press of work the young evergreens, from two to four inches high, were merely mulched with straw, instead of being shaded. The result almost justified a continuation of the plan. White pine, white and Norway spruce and balsam fir did as well as with shade, but red pine (*P. resinosa*) and Austrian pine were almost complete failures.

In small fruits, we have a good beginning in raspberries and about a dozen varieties of the strawberry.

In all our work with trees and fruits great care is taken to keep the varieties properly labeled; this becomes of supreme importance, and requires vigilance where the number or sorts is so great, and the number of trees so few as they are at present. I have a firm hope that in the long list already secured, to which additions will be made every year, something absolutely hardy will be found. If a single sort of the entire number should prove good in fruit, late in season and hardier than our hardest, it will more than repay all outlay and expense, though all the rest prove failures.

In addition to the above lines of work with fruit, we have grown during the past season for illustration and experiment, every variety of garden vegetable adapted to the soil and climate of Minnesota, embracing varieties of potatoes, corn, beans, peas, celery, cabbage, cauliflower, carrot, cucumber, lettuce, melons, okra, onions, parsley, parsnips, salsify, spinach, etc., etc.

Besides this work in horticulture, we have carried on all the operations of general farming and have made a commencement with stock, and the dairy. We have fine representations of Short Horns, Holsteins and Jerseys in cattle, Berkshires, Poland Chinas and Durocs in swine, Shropshire Downs in sheep, and expect to add to these breeds as soon as funds are available for this purpose.

But not to detain you longer I here extend a most cordial invitation to the Horticultural Society to hold its next Summer Meeting at the Experimental Farm, when the members and their friends can have an opportunity of seeing for themselves what we are doing for the farmers and horticulturists of Minnesota.

*LIST OF FRUITS

GROWING ON THE UNIVERSITY EXPERIMENTAL FARM, SEASON OF 1885.

HILLSIDE ORCHARD.

APPLES, Native.

- | | | |
|---------------------|----------------------|-----------------|
| 10. Whitney No. 20, | 10. Orange Crab, | 10. Strawberry, |
| 39. Wealthy, | 10. Beechs Sweet, | 10. Minnesota, |
| 39. Duchess, | 5. Perce's Seedling, | 5. Giant Swaar. |
| 10. Tetofsky, | 5. Rollins Pippin, | 5. Ponas. |

APPLES, RUSSIAN, Selected list.

- | | |
|-----------------------------|-----------------------------------|
| Aport, Orient. | 187. Glass Green. |
| Early Sweet—Vor. | 200. Renz Little Turnip apple. |
| Arkaa—203—W. | 232. Haw Pipka. |
| Antounooka—236 W.—26. M. | 277. Warsaw. |
| Borovinka. | 282. Woronech's. |
| Sobrin Kosteiana. | 284. Kremer's Glassy. |
| English Pippin. | 286. Kremer's Seedling. |
| Genchevka. | 316. Red Queen. |
| Green Sugar. | 361. |
| Large Borsdorfer. | 365. Ananasnu. |
| Plodovitka. | 206. Czars Thorn. |
| Rubets Native. | 252. Aport—O'Porto Apple—23. M. |
| Serinka-Riga. | 262. Charlamoff. |
| Yellow Transparent. | 375. |
| 3. M—277. Lead apple. | 382. Russian Green Apple. |
| 18. M. Anisomooka. | 402. Borsdorf. |
| 4. M. Slikleanka. | 407. Blackwood—53. M. |
| 20. M 447, Reinette Kuiski. | 410. Little Seedling. |
| 22. M. Colville Krasnui. | 413. Cross Apple—15. M. |
| 5. Oriel. | 442. Yellow Calville. |
| 56. Vor. | 447. Queen of Kiew. |
| 21. Vor. | 457. Klineff's Apple. |
| 257. Arabskoe Vor. | 469. Grandmother's Apple—6. M. |
| 105. Russian Gravenstein. | 477. Christ's Birth Apple—161. M. |
| 121. | 508. |
| 169. Green Sweeting. | 599. Romenskoi—Omensk—11. M. |
| 177. Green Streaked. | 984. Anis Kurski. |
| 185. Anisette Anisowka. | 934. 1,277. |

*The list of trees, etc., reported at the summer meeting as having been set at the State Experimental Farm, is included in the list herewith presented.

RUSSIAN PEARS.

16 Oriel; 17, Vor. (on Pirus Aria); 102, Vor; 702, Vor; 27, Riga; 342, 347, 358, 391, 396, 439.

¶ Of the Russian varieties we have about 2,500 root-grafts growing, of twenty-two of the most promising.

RUSSIAN PLUMS.

PLUMS.

- 1 Russian.
- 6 Rollingstone.
- 10 De Soto.
- 10 Forest Garden.
- 10 Weaver.

RASPBERRIES.

- Turner.
- Cuthbert.
- Superb.
- Gregg.
- Golden Cup.
- Doolittle Blackcap.

CURRANTS.

- Fay's Prolific.
- Stewart's Seedling.
- Red Dutch.

- White Dutch.
- White Grape.
- Black Naples.

GOOSEBERRIES.

- Houghton's American Seedling.

- Chas. Downing.

GRAPES.

- Concord.
- Niagara.
- Janesville.
- Delaware.
- Pocklington.
- Prentiss.
- Lady.
- Martha.
- Moore's Early.
- Empire State.

- Brighton.
- Ives Seedling.
- Goethe.
- Hartford Prolific.
- Salem, Rogers 53 or 22.
- Worden.
- Wilder, Rogers No. 4.
- Merrimac, Rogers No. 19.
- Lindley, Rogers No. 9.
- Agawam, Rogers No. 15.
- Iona.

BLACKBERRIES.

- Snyder.

RUSSIAN MULBERRY.

STRAWBERRIES.

- Crescent.
- Countess.
- Chas. Downing.
- Capt. Jack.
- Glendale.
- Iron Clad.
- James Vick.

- Jersey Queen.
- Manchester.
- Minnetonka Chief.
- Green Prolific.
- Wilson.
- Windsor Chief.
- Rays Prolific.

RECAPITULATION.

Apples, 67 varieties; Pears, 11; Plums, 5; Currants, 6; Gooseberries, 2; Grapes, 21; Raspberries, 6; Blackberries, 1; Strawberries, 14; Mulberry, 1. Total 133 varieties.

LIST OF STOCK

GROWING IN THE NURSERY OF THE EXPERIMENTAL FARM OF THE UNIVERSITY OF MINNESOTA, PLANTED IN SPRING 1885.

2500 Root Grafted Russian apples.	500 European Larch.
560 Potted Grape Vines.	100 American Larch.
2000 White Willow.	30 Catalpa Speciosa.
500 White Pine.	100 European Mountain Ash.
500 Austrian Pine.	500 White Ash.
500 Scotch Pine.	500 Green Ash.
500 Red Pine.	100 Black Walnuts.
500 Mountain Pine.	100 Wild Cherry.
500 White Spruce.	1000 Box Elder.
500 Norway Spruce.	200 Norway Maple.
24 Colorado, or Blue Spruce.	10 Salix Napolemis.
500 Balsam Fir.	10 Salix Argentea.
10 Abies Concolan.	10 No. 123, Russian Willow.
200 Hemlock Spina.	10 No. 31, Russia Willow-Riza.
24 Douglas Spina.	10 Russian Poplar.
500 American Arbor Vitæ.	500 Russian Mulberry.

RECAPITULATION.

Artichokes, 1 variety; Asparagus, 1; Beans, 24; Beats, 14; Brusseles Sprouts, 1; Brocoli, 3; Cabbage, 7; Carrots, 8; Cauliflower, 2; Celery, 6; Corn, 26; Cucumbers, 9; Kohl Ra'bi, 2; Lettuce, 7; Melons, 22; Nastertium, 2; Okra, 3; Onions, 14; Parsley, 2; Parsnips, 4; Peas, 22; Potatoes, 362; Radishes, 7; Rhubarb, 2; Salsify, 1; Spinach, 4; Squash, 8; Tomato, 5; Turnips, 6; Rutabagas; Herbs, 12. Total, 593 varieties.*

FINAL RESOLUTIONS.

Mr. Harris, from the committee on Final Resolutions, presented the following report.

The committee on Final Resolutions would respectfully report: That the thanks of the Minnesota State Horticultural Society are due and are hereby tendered to the citizens of Minneapolis, for the generous offer of hospitality and the liberal entertainment they have given us at their homes and at the Nicollet House, thereby making our sojourn in their beautiful city both pleasant and agreeable. To the various railroads leading to this city for rebates from their regular fare, to delegates and members in attendance. To the editors of the daily papers of Minneapolis and St. Paul for the many cheering words they have spoken for this Society in the past, and to the gentlemanly representatives of the Press who have honored this meeting with their presence and so ably and correctly reported the same. Also to our retiring President Truman M. Smith, Secretary S. D. Hillman, and the Executive Committee for the prudent and economical manner in which they have managed the financial and other affairs of the Society during the past year.

*NOTE.—For lack of space the complete list, *in extenso*, of vegetables and cereals is omitted here.

Also to the delegates in attendance from State Societies of Iowa and Wisconsin for the assistance and encouragement they have so ably rendered us at the present meeting.

J. S. HARRIS,
A. W. SIAS,
G. W. FULLER,

Committee.

Mr. Pearce moved a vote of thanks to the proprietors of the Inglewood Springs for supplying the Society during its session with pure and healthful spring water, which motion was adopted.

IN MEMORIAM.

REPORT OF THE OBITUARY COMMITTEE.

To the Horticultural Society of the State of Minnesota:

MR. PRESIDENT AND GENTLEMEN:—Your committee have to report with much sorrow and regret, the death during the past year of D. W. Humphrey, of Faribault, one of our most respected, honored and useful members, and a man of great merit and worth. Honest and faithful in every walk of life, lending a willing, helping hand in the cause of humanity, he was universally respected by a wide and extended acquaintance.

Mr. Humphrey was a son of the late Dr. Levi Humphrey, and was born April 23, 1826, in the town of Southwick, Mass. He came to Minnesota as early as 1855. In the spring of 1857 he was married to a most estimable lady, in Suffield, Conn., and his married life was a happy and eventful one. Mr. Humphrey contributed much during his lifetime to all that would elevate and better the condition of mankind. He was an earnest and efficient worker in all that appertained to horticulture. A member of a Christian church, his sympathies extended to all classes of people. He was anxious for the welfare of all. We feel that not only this Society, but the State at large has met with a great loss in his death.

Your committee in conclusion would report the following resolutions for your consideration:

Resolved. That the State Horticultural Society of Minnesota learn with much regret the death of D. W. Humphrey, late of Faribault, in this State, which sad event occurred at his residence in that city on the 13th of October last.

Resolved. That this Society extends to the widow and family of our late associate our most heartfelt sympathies in their sorrow and affliction.

COL. J. H. STEVENS,
A. W. SIAS,
S. D. HILLMAN,

Committee.

The resolutions were adopted and ordered placed on file.

DELEGATES TO WISCONSIN.

On motion of Mr. Harris, Truman M. Smith was appointed a delegate to the meeting of the Wisconsin Horticultural Society, at Madison, commencing Feb. 2, 1886.

On motion of Secretary Hillman, J. S. Harris was also named as a delegate to that meeting.

President Smith. I wish to express my thanks to the Society for this mark of confidence; and, before we adjourn, I feel that I would

like the indulgence of the Society for a moment to say a word as to the future status of the Minnesota State Horticultural Society. Prof. Porter's remarks very forcibly called to my mind some facts which some of the members present may know to be true. When he was describing the advantages and resources of our State agricultural college at the university and university farm, and the chances for boys to learn, the paraphernalia for studying the whole thing out, it called to mind the time when I was first appointed by this Society to visit the State University, and to make a report upon their proceedings there. Gentlemen, you would be astonished when I tell you the facts. I went there some thirteen or fourteen years ago. The professor was instructing a class in botany by lines drawn upon the blackboard; Col. D. A. Robertson was the professor. He called upon me for a little speech. I told them I didn't know how to commence; I found myself in a very awkward dilemma; I felt that I was about the only green thing about the institution. I felt that I might make a very proper "subject" for the study of botany. [Laughter] Look at the contrast to-day; observe the change in our society! And who has helped to bring about some of the marked changes and has stood shoulder to shoulder with his part of the work to keep alive the interest and advance the progress of the Society? Wyman Elliot of Minneapolis, the one whom you have chosen to act as your President for the coming year. I feel that with his energy, his perseverance, his knowledge of horticulture, as your President, with the help of able assistants, he will be enabled to accomplish much for the cause of horticulture. But, gentleman, if you expect him to take this Society upon his shoulders and carry it alone you will be disappointed. Let every member give him that aid and encouragement that he has always given to the State Horticultural Society and then you will make a grand success of your efforts in the future.

Mr. Gould. Before President Smith leaves the chair I want to move a vote of thanks to our late President for his earnest efforts and the faithful and able manner in which he has discharged the duties of the position.

The motion was adopted.

Mr. Harris. I wish to endorse what President Smith has said in behalf of Wyman Elliot, for I believe he has not exaggerated his work for the Society, in the least. And if I have been enabled to do anything for the Society in the past it has been very largely due to the assistance he has given me.

President Smith. I wish to say further that during the time I have had the pleasure of being your presiding officer I have not been able to serve you so faithfully as I could wish. What little land I occupy has been taxed to an enormous extent by the city and Board of Public Works. To illustrate, from five acres I have been working and using as my means of support I have had to pay twelve hundred dollars of taxes for city assessments, etc., consequently I have not given the time to the Society that I otherwise might have done. This is my only excuse. My heart has been with the Minnesota State Horticultural Society; I have been ready and willing so far as my means and health would permit to work for its success.

Secretary Hillman said that he desired, before the final adjournment of the meeting, to say a word by way of acknowledgement for the mark of favor and confidence on the part of the Society, in re-electing him to the position of Secretary, which was all the more gratifying to him, being done while he was necessarily in attendance, at Winona, as a witness in an important railway suit. He hoped in the future as in the past to receive the cordial support and encouragement of the members of the Society in the discharge of the duties of the responsible position, and promised to cheerfully work for the advancement of the interests of the Society, so far as he might be able so to do.

Mr. Kellogg. On behalf of the delegates from the Wisconsin State Horticultural Society, I wish to say that we have been received most kindly, and most generously entertained, for which we desire to return our sincere thanks. We are very glad that you have appointed to-day two of your number to attend our next annual meeting at Madison. I tell you it takes the hair right off up here—these winter breezes—and that's what makes you so smart. [Laughter.] Sometimes it is said that it is the women that take the hair from some men's heads. I never had my cheeks frozen until this morning; the hair hasn't come off yet, but I don't know but it will. In such a country it takes men that can get up in the morning and "get," to raise fruit; down our way we can raise apples on dead trees. [Laughter.] I can show you a specimen of that kind. We shall have a one-horse affair at Madison; we don't expect to do as well as you. We meet with the State Agricultural Society, and this year our joint convention terminates with a two days' session of horticulture. But we will give you a most cordial welcome and reception.

Mr. Harris moved that the salaries of officers be fixed for the ensuing year the same as last, to-wit: of the President, \$25; of the Secretary,

\$400; of the Treasurer, \$25, and of the Librarian, \$10. The motion was adopted.

Mr. Ditus Day was requested to state how the fair in Rice county was held successfully without horse-racing.

Mr. Day said he would ask Mr. Harris, who was present at the fair, to give the information asked for.

Mr. Harris. I can only say, Mr. President, that I attended the fair at Farmington and I think it was the best county fair I ever attended. The exhibits were first-class, the attendance good and everything went off pleasant and cheerful. Nobody got tired of it. One of the causes of their being able to keep the people there was that they provided for their entertainment. They had several speakers there who gave short addresses. Gov. Hubbard presided and while the fair was going on instead of being disturbed with horse-racing the people had an opportunity to get some instruction. There is no reason why similar fairs may not be made a success all over the State. No premiums were offered for racing, and everybody knew there would be no prizes for fast horses. The result was that the premiums awarded for vegetables, etc., were promptly paid. Exhibitors brought their products in large quantities and went home with their money in their pockets.

President Smith. The great state of New York holds her fairs without any horse-racing or any premiums on fast horses and has followed that plan for several years, and with as much success I think as any state in the Union.

Mr. Day. I may state that while they got their premiums on the vegetables last year it has not been the case when we had horse-racing.

REMARKS OF S. M. OWEN.

Mr. S. M. Owen, editor of *Farm, Stock and Home*, being present was called upon to address the Society and came forward and said:

Mr. Owen. Mr. President, if this was a base ball match I would call "foul." I don't know what I have done that I should be submitted to an ordeal of this kind, simply because I happen to be connected with an agricultural, and to a certain extent, at least, a horticultural paper. I don't know what good I can do you, unless it is to let the light of my countenance shine upon you for a few moments. I am quite sure I can give you no lessons in practical horticulture that will do you any good, or add to the sum of your usefulness or morality. It has been a good many years since I did anything in practical horti-

culture, raising horticultural products of any kind, and then my most successful efforts were when the owner wasn't looking. [Laughter.]

I have heard a good deal of discussion here about the "hardiness" of fruit, especially apples. I remember in my youth I used to be pelted by apples that were "hard" enough to satisfy me, and ought to satisfy the ambition of a Minnesota winter. [Laughter.] I think I could suggest to you some improvement in raising water-melons, for instance; I remember when I used to aid in raising a big crop in a small portion of a single evening—vines and all. [Renewed laughter.]

I have been a silent listener to your discussions during the sessions of this meeting; I hoped I would be allowed to remain a listener. This convention has suggested the thought to me that our civilization commenced at the wrong end. It seems that we are just arriving at a point where we should have commenced a thousand years ago. Civilization and science began by studying the heavens, measuring and analyzing the stars, and even trying to penetrate the mysteries of the future, hundreds of years before they began to study the wonders and capabilities of the despised clods at our feet. You gentleman are beginning to do that. You are beginning to learn the basis of the earth we live upon. In fact, the philosophers, the logicians, the moralists, the artists and the poets that are doing the world the most good to-day are found in the ranks of just such men as yourselves. This is not "taffy," gentlemen, and no bouquets are expected. Even now, if you gentleman here were long-haired, hollow-cheeked and dispeptic, and were discussing abstruse questions about the "thinness of the whereas"; or if a man is unable to contain himself; is he too large or too small?—or some other philosophical subject, this hall would be full of people, sitting and listening to your "great wisdom." But you are here discussing questions of vital importance and practical value, and yet you are hardly deemed worthy of an audience of a single person, aside from those who are interested in your work.

For ages past much that has passed for genius of the noblest kind has been employed in painting mythological gods and saints, trying to discover something of the unknown world, or speculating on questions of no practical value; but you, gentlemen, are the logicians of the hardy tree; you are the philosophers of an apple that will stand the winters of Minnesota; you are the moralists of the beautiful and the good—the good to the taste and the beautiful to the eye—you are the poets of the flower and the fruit; as such I address you, and regarding you as such I cannot trespass on your time longer. I bid you good evening. [Applause.]

THE NEXT ANNUAL MEETING.

On motion of Mr. Harris the place of holding the next annual meeting was fixed at the State Capitol, St. Paul, commencing the third Tuesday in January next.

Prof. Porter. Mr. President, I would like at this stage of the proceedings of this meeting to call up a matter for a little consultation and action, if possible. It is well known that the State Amber Cane Association is a child of the State Horticultural Society; that a few years ago they were in the same house and fed at the same table, but in the course of time with increasing growth the boy felt himself a little bigger than the "daddy" and he wanted to set up for himself. This Society kept it, as it were, in lead strings for awhile and extended its fostering care. But the Amber cane industry for two or three years past, owing to circumstances entirely beyond control, the existing low prices of syrups, unfavorable seasons, etc., has had a damper thrown over it and we have not been able, out of a membership of some 250, perhaps, to secure the attendance at our meetings that we ought to have. I find in looking over our list of membership that nearly all our members are also members of the Horticultural Society. They want to attend both meetings, but do not feel like taking a second week to go to both meetings. It is impossible to carry on the operations of these two societies at the same time. What I would suggest is that we might get a day out of the week that the State Horticultural Society meets for our meeting, and, if necessary, have a meeting of five days' session for both societies. Or, I would suggest that time might be saved by accepting papers presented by their titles and placing them on file for publication. As papers are read here they do not do a tenth of the good that one gets from sitting down and carefully reading them at his leisure. Nearly two-thirds of the time of this meeting has been taken up with the reading and listening to these papers, although I will say in this connection that of the six meetings of this Society which I have had the pleasure of attending that I consider this by far the best of the six—and I consider the papers that have been presented here by far the ablest papers we have ever had presented before any meeting of the State Horticultural Society.

President Smith. A four or five days' meeting is the most that we could get. It seems to me it might be arranged if the Amber Cane Association could get through with its work in half a day.

Prof. Porter. I think it would be better if we could get a day. We hardly get warmed up in half a day.

Mr. Elliot. I have been thinking of the matter somewhat, that perhaps we might "sandwich" in the Amber Cane meeting by taking half a day for the Amber Cane Association, with perhaps an evening session. Some of their work could be done by having committees appointed to arrange their work, and our committees could do the same way.

Mr. Smith moved that the Society hold a five days' session instead of four.

Mr. Barrett. Allow me a suggestion. I come about three hundred miles on the Manitoba road and I could not attend the entire session. But I speak only for that part of the State.

Mr. Ditus Day moved to amend the motion by leaving the matter under consideration with the executive committees of the two societies, the motion was adopted.

Mr. Elliot. Mr. President and fellow members: For the honor you have conferred upon me in electing me as your President for the ensuing year I would return my grateful thanks. I do not know whether I shall be able to conduct your meetings as ably, present and dispatch the business of the Society as readily as Brother Smith has done, but if you will give me your assistance I will try to assist the members of the Society in carrying on the work successfully. When I came to this State I was a mere boy. I have grown up here in Minnesota and have devoted a portion of my time to horticulture. It has always been my pride to assist whenever I could in that direction. I feel grateful for this honor which you have conferred upon me and shall try to do the best I can to serve you. The standing committees will be appointed and announced hereafter.

On motion the meeting then adjourned *sine die*.

SECRETARY'S PORTFOLIO.

DEFERRED PAPERS, REPORTS, NOTES, EXTRACTS, ETC.

INTRODUCTORY NOTE BY THE SECRETARY.

The space which necessarily has been given to the routine report of the Society's transactions, to the discussions had at its annual meetings, and to the publication of all the varied information there presented, has greatly limited the number of the pages which otherwise would be available for the insertion of editorial clippings, extracts and certain items of more or less importance, which very naturally and properly, perhaps, should find a place in this department of the work.

We here would call attention to the numerous papers read, and to the interesting reports presented, concerning horticultural work, as set forth in foregoing pages. We do not doubt the officers and members of the Society will feel both pride and satisfaction at the interest taken upon the part of those who have so generously contributed, and thus have shown their willingness to aid in the advancement of the worthy cause of the Society. Those who peruse the pages thus devoted to the various subjects treated, will find we trust some indications of the zeal and the progressive spirit that animates the earnest workers in our ranks in this and other states.

The topics treated may embrace a wider scope, or range, perhaps, than usual; but still, we think, not more than circumstances fully justify. The quite phenomenal experience of horticulturists within the year, has surely called for sober thought, and has made necessary deep investigation, to find if possible the cause of certain changes which have taken place, in order to elicit information with regard to best and wisest means and methods to be used, to profit by the many lessons learned.

One pleasing feature which we may refer to here—as characteristic of the present volume—is the elucidation of such newer facts and

figures, theories and plans, as have been found of value, gained by most recent observations, experiments and actual tests, that have been made by those who take an active interest in the cause of horticultural work and experimentation. Discussion has been had of timely topics. Results to be thereby obtained, and the conditions of success, are outlined here in language clear and plain. This setting forth of proper methods to be used is certainly to be commended.

Fruit growers seem determined to pursue their work in spite of dire disasters of the past, until some means may be obtained whereby the noxious insects, fruit diseases and such climatic influences, as heretofore have proven so destructive, may be, perchance, quite overcome.

No doubt much interest will be felt upon the part of some regarding certain novel theories which are herein advanced. If real progress is thereby promoted the object had in view will be, we trust, subserved; for it should be the constant aim to obviate the difficulties in the way of that success which is alone attainable by persevering effort and by patient toil. To winnow out the chaff and treasure up the golden grain should be the object sought by all.

MEETING OF THE EXECUTIVE COMMITTEE.

A meeting of the Executive Committee was held at St. Paul, March 11, 1886.

There were present at the meeting of the Executive Committee, President Elliott, Treasurer Grimes and Messrs. Harris, Pearce and Smith of the Executive Committee. In the absence of committeeman Underwood, S. M. Emery, of Lake City, was elected as member of the Executive Committee, pro tem.

By vote, S. M. Emery was elected secretary of the meeting.

The expenses of Truman M. Smith, \$18.15 and of J. S. Harris, \$8.50, delegates to the winter meeting of the Wisconsin Horticultural Society, were allowed.

It was decided to request the consolidation of the divisions G, H, and I, of the premium list of the State Agricultural Society, the same to be under the management of the Horticultural Society and to request the Agricultural Society to appropriate the sum of \$2,000 for premiums, to disburse for the three divisions. Division "G" relates to fruits and flowers; division "H" to vegetables, and division "I" to sugar, syrup, and honey, bread and domestic pantry stores.

REPORT OF DELEGATES TO WISCONSIN.

To the Secretary of the Minnesota State Horticultural Society :

The undersigned would respectfully report that we accepted the appointment as delegates to attend the annual meetings of the Wisconsin State Horticultural and Agricultural Societies, held at Madison, Feb. 1, to 5th, 1886, and availed ourselves of the privileges afforded by attending the same.

The meetings of both societies were held in rooms of the capitol building, were well attended by representative men from different sections of the state and conducted in a manner that was both interesting and profitable to all who were so fortunate as to be present. We being horticulturists, of course the horticultural meeting received the most of our attention.

The program of the first day, made the business for Monday evening miscellaneous and informal, and the time was largely taken up in greeting the members as they arrived, unpacking and arranging articles for exhibition.

The business of Tuesday was opened with the report of the Secretary, in which he spoke of the advisability of establishing horticultural experimental stations for the purpose of originating new varieties of fruits adapted to general cultivation in the state, getting thorough tests of their value and hardiness under different conditions before recommending them for extensive planting, and also for conducting investigation of the various insects and fungoid enemies that are becoming so damaging to orchards and gardens, to ascertain more practical remedies, these stations to be under the supervision of competent men selected by the society.

Following this came reports from the members of the committee of observation. The general tenor of these reports was that the winter of 1884-5 was most damaging to orchard and nursery trees, including most of those varieties that had been called iron-clad, that was ever experienced in Wisconsin. Mr. J. C. Plum, of Milton, read an elaborate paper favoring the division of the state into fruit districts, the division lines to conform to the peculiar geological and climatic characteristics pertaining to the various sections of the state. He also advocated the issuing of fruit lists showing the most suitable kinds for growing in the several districts. The matter of dividing a state into districts, mapping them out and recording in each section, the character of the soil and formations with relative advantages they possess, the proximity to bodies of water or timber, and elevation, is a good one as it

enables the horticultural society to do particular work for each district without neglecting the best interests of others, and as soon as practical a committee should be appointed to make a careful survey of our State and arrange it into suitable districts. The question of experimental stations was discussed at considerable length and favored by all the members present, and resulted in the adoption of a resolution requiring the president to appoint a committee to take action looking to the establishment of such stations.

The annual address of President J. M. Smith was an interesting document in which he, in his free and lucid manner, spoke of the grand display of orchard fruits made by the society at the New Orleans Exposition last winter, and the joyous feelings of the horticulturists over their successful competition with the states of the northwest, which made them "proud of their state and hopeful that a new and prosperous era was dawning upon those engaged in horticultural pursuits." When spring opened the joy was turned to sorrow by the great disaster that had befallen their state and the whole northwest, the complaint of dead and dying trees was almost universal, and the question is everywhere asked "What shall we do?" "We want something better" He said, All are anxious and hope that we have something better in store for us; that we are upon the dawn of a better day. I cannot but believe that between the many varieties of new Russians and new seedlings we shall find at least a few varieties that will endure our most severe winters with impunity, yet the experience of many years bids us be careful what we recommend." He further said, "You are doubtless aware that tree peddlers are already selling so-called Russians in all directions. Would it not be well to insert in our fruit lists a word of warning or some resolution in this respect that might be of benefit to those who will look with unusual interest for our next volume of transactions? While many of us firmly believe and all of us hope that we have some valuable varieties as well as perfectly hardy ones, none of us expect them all to be of permanent lasting value." He also spoke a good word for the Manchestr strawberry, which will carry with it great weight as he is a strawberry grower of large experience and in whom the people have confidence.

Before the adjournment of this session Professor T. J. Burrell of Champagne University, Ill., was introduced to the audience and gave a very interesting talk on "bacteria and fungoids." He is a pleasant speaker and is considered as the best known authority on "bacteria." He has spent much time in conducting microscopic investigating of

the blight that has of late years proved so destructive to western orchards and proves that it is a living organism of very low type, that it is capable of reproducing and multiplying itself ad infinitum where surroundings are favorable, and showed very plainly how it worked in the organism of the growing plant, and stated that no perfect preventive had yet been discovered. He also gave an able address on the apple tree before the Agricultural convention with blackboard illustrations showing the circulation of the sap, how cells and tissue are formed and the additional layers of wood are made—and explained the probable cause of winter-killing. He attributes much of the injury to summer's drouth and seemed to favor moist locations for orchard sites.

The evening session of this day was passed over in order to allow the members to be present at the opening of the agricultural convention in the assembly chamber and to listen to the annual address of President A. A. Arnold. His address was earnest, pointed and practical; he spoke like a man that was proud of his state and his calling, and congratulated the societies taking part in this convention, in the grand work of education that was going on, making agriculture the most sure way to wealth and the most laudable of all pursuits, and further said the state had adopted a wise policy in causing to be published for free distribution among the farmers, 13,000 volumes of about 1,000 pages, containing the cream of the work of all of the state societies, in addition to furnishing the horticultural society, dairymen's association and experimental farm a liberal quota of their own transactions bound separately.

Wednesday, Feb. 3., was an interesting day with the horticulturists; papers on our Russian fruits were read by A. G. Tuttle, H. H. Howlett and Geo. P. Pepper, and followed by an animated discussion of their merits. If we rightly understand the sentiments of the Wisconsin horticulturists on the Russians, they do not expect them to meet all of the future wants of this country, but believe the coming apple is to be a seedling of this country, perhaps of Russian parentage, or a cross with our native sorts. Considerable time was devoted to the revision of the fruit lists, discussing crab apples, how to work and grow trees, selecting of varieties as parents for seedlings, etc., in all of which we were interested but it would make our report too lengthy to more than allude to them. This day virtually closed the work of the horticultural society.

The Iowa horticultural society was represented there by two

of her most prominent members, C. G. Patten of Charles City and C. L. Watrous of Des Moines, and the Illinois Society by Professor T. G. Burrell of Champagne, and J. V. Cotte, all of them gentlemen whose acquaintance it was a pleasure to make. Thursday, the 4th, was by far the most interesting day of the agricultural convention and the audience was large and attentive. One of the pleasing features of the day was the great number of ladies in the audience and, another the intensely interesting papers by Mrs. Dr. Juliette Severence of Milwaukee; subject, Farmer's Wives. Mrs. Ida E. Tilson, West Salem, Home Adornment, and the Education of our Girls, by Mrs. Vie H. Campbell, Evansville.

The exhibition of fruits although hardly up to other years was very fine and numbered about 558 plates, among them about sixty varieties of apples, twenty-two of grapes, three of pears and a collection of cranberries, in six or seven very distinct varieties, by S. and A. C. Mills, of Madison, several of these were cultivated and have been greatly improved through a careful selection of plants for setting, and we understand that a part of them were seedlings; for size and beauty they excelled anything of the kind we had before seen, and shows plainly that this hardy and valuable fruit responds liberally to cultivation and should engage more of our attention than it has heretofore received. The Messrs. Mills have promised to give us a paper and make an exhibit at our next winter meeting. The varieties of apples upon exhibition showed very plainly that there are sections in Wisconsin where the trees did not suffer as severely in the last winter as in Minnesota. There were among them several new seedlings of extra quality and good appearance, but from what we were able to learn of their parentage, we can hardly expect that any of them will be of value to us, yet they encourage us in the belief that the originating of new varieties by selection of seed is a move in the right direction. We were disappointed in not finding a collection of new Russians in the exhibit.

In conclusion we will say that we believe these annual conventions of the Wisconsin farmers are placing the Wisconsin agricultural society into a position far in advance of ours. We may and we intend to beat them in the management of our State fairs, but they are beating us in the dissemination of knowledge among the people, and encouraging a sentiment favoring better homes, better farms and better educated men and women to manage them. We regret that our farmers cannot enjoy the benefits of such conventions, and that our

legislature has not been educated to that point where they could realize something of the benefits that would flow to our people by granting a little encouragement in the way of state aid to farmers' institutions and agricultural conventions. Our thanks are due to the officers and members of the Wisconsin society for the cordial welcome extended us, and the hospitality and kindly attentions that made our visit in Madison both pleasant and profitable, and to our own Minnesota Society for honoring us as her delegates upon this occasion. We hope that we have received benefits that shall enable us to become more useful members, and that we have formed valuable acquaintances who will lend us their aid in developing the fruit resources of the great northwest.

Again we thank the officers and members of the Minnesota State Horticultural Society for the honor conferred upon us, and the privilege afforded us of meeting upon their own stamping ground, those old veterans of Wisconsin horticulture, Smith, Pepper, Tuttle, Kellogg, Plumb and a score of others, and last, but not least, Hatch the "young America" of the society.

TRUMAN M. SMITH,
J. S. HARRIS,
Delegates.

St. Paul, Minn., February, 1886.

LOCAL SOCIETIES.

The following reports from local horticultural societies are herewith presented:

GERMAN AGRICULTURAL AND HORTICULTURAL SOCIETY OF RAMSEY COUNTY.

S. D. Hillman, Secretary etc.:

At your request I will send you a list of the officers of the Ramsey County German Agricultural and Horticultural Society, as follows, to-wit:

President—Adam Bohland.

Vice President—Alex. Knuze.

Secretary—Louis Edlefsen.

Financial Secretary—Ernest Veuzke.

Treasurer—Aug. Giesmann.

Executive Committee—Charles Bunde, Wm. Muller and John Lorenz.

The society has about fifty members, meets on the third Saturday in each month at Turner hall, St. Paul, where papers on various subjects pertaining to agriculture and horticulture, are read and discussed.

Yours very truly,

ADAM BOHLAND.

LAKESIDE HORTICULTURAL SOCIETY.

ORGANIZATION AND PROCEEDINGS.

March 25.—Secretary's minutes of organization and subsequent proceedings of the Lakeside Horticultural Society, with headquarters at Brown's Valley, Minnesota.

First meeting was called to order by J. O. Barrett.

On motion, J. O. Barrett was elected temporary chairman and A. S. Crossfield, secretary.

Upon motion of D. L. Roach, seconded by J. G. Todd, and carried, the chairman was authorized to appoint a committee of three, of whom the chairman should be chairman, to draft a constitution for the society, and who should report at next meeting.

Pursuant thereto the chairman appointed J. S. Harris, H. C. Bartlett and J. G. Todd.

Upon motion the meeting then adjourned to meet at three o'clock on the 26th of March, 1886.

March 26.—Pursuant to adjournment, the meeting was called to order at 3 p. m., by the chairman.

The first business was the report of the committee on constitution.

The president and ex-officio chairman of committee reported, and the constitution was then circulated for signature among the people present and twenty-six names were subscribed, as members of the society.

The members thus appearing then went into regular session and on motion of E. F. Crawford, seconded by H. L. Mills, the meeting authorized the chairman to appoint a committee of three who should report to the meeting as soon as possible the names of persons who should act as president, vice president, secretary and treasurer of the society until the next election of officers.

Pursuant to such authority the chairman appointed to act as such committee, E. F. Crawford, H. L. Mills and J. Robinson.

The committee reported as follows, viz. :

President—J. O. Barrett.

Vice President—D. L. Roach.

Secretary—A. S. Crossfield.

Treasurer—Jos. Branch.

On motion, the temporary secretary was authorized to cast the unanimous ballot of the meeting for these persons as officers of the society. The ballot was so cast.

The society then went into regular session with all the officers and many others present.

On motion, the president was authorized to appoint a committee of three, of which the president should be chairman, to draw up and present at the next meeting certain rules and regulations to be adopted as by-laws of the society.

The president then stated more fully the object of the society, and was followed by J. S. Harris, of the State Horticultural Society, who gave a very instructive talk on the subjects of forestry and horticulture. His long experience in the rigorous climate of Minnesota gave his remarks great weight, and aroused a good feeling and friendly discussion which was participated in by many present, to the benefit of all.

Moved by H. L. Mills, seconded by J. G. Todd, that the name of this society be the Inter-Lake Horticultural Society. Amendment was offered by A. S. Crossfield that the word Inter-Lake be stricken out and Lakeside substituted. E. F. Crawford offered an amendment substituting Brown's Valley, but upon being shown that this name appeared exclusive, it was withdrawn. The amendment was accepted and the motion given to the meeting and carried.

On motion of E. F. Crawford, the meeting was then adjourned to meet at 2 o'clock on the 27th of March, 1886.

March 27.—Pursuant to adjournment, the society met and was called to order by the president, all of the officers present.

The society then resolved itself into a committee of the whole for the discussion of ways and means, and as a result of such discussion it was decided that upon Arbor day this society should make a great effort to set out trees about all the public buildings, and along the streets of the village, in its territory.

Mr. Campfield spoke of the great benefit to schools. A. S. Crossfield thought the children likely to destroy the trees. J. G. Todd suggested the remedy, by suggesting that the children assist in setting out the trees and so have an interest in them. This solved the diffi-

culty in a moment. A. S. Crossfield made a motion, seconded by J. G. Todd, and carried by acclamation, that every school child in this section of the country who would send his or her name to the secretary would become an honorary member of the society, and that a committee of one be appointed by the president in each school district now represented in this society or which might hereafter be represented, which committee should endeavor to obtain the co-operation of the teachers in each district and appoint assistants to decorate the school grounds by setting out trees thereon on Arbor Day.

Committees were appointed as follows in this county:

District No. 6, David Burton; No. 4, Geo. Christian; No. 35, James Layden; No. 5, A. Paul, Sr.; No. 3, Geo. M. McLain; No. 2, D. L. Roach; No. 22, A. S. Crossfield; No. 7, C. C. Mills.

In Big Stone county: District No. 15, J. Robinson; district of Beardsley, Jos. Branch.

On motion it was then unanimously voted that an executive committee of five, of which the president should be chairman, should be appointed, which should confer with the local committees and have power to call meetings by publication of notice.

After further discussion by Dr. Marshall, Messrs. Todd, Campfield, Christian, Burton and others, motion was made by W. K. Weaver, seconded by J. G. Todd, and carried, that the secretary be ordered to furnish a copy of the minutes of this society to the press.

Upon motion the meeting then adjourned until called to meet by the executive committee.

A. S. CROSSFIELD, Secretary.

MCLEOD COUNTY HORTICULTURAL SOCIETY.

GLENCOE, MINN., June 7, 1886.

S. D. Hillman, Secretary, etc.

Inclosed find clipping from the Glencoe Register of March 4th, containing an account of our first meeting, which was held Saturday, Feb. 27, 1886. We organized with eleven members, and now number twenty-five. Have held three meetings since we organized. Find it a little hard to get the members together, but intend to make it so interesting that they cannot stay away from a single meeting. Would like to send a fuller report, but am too busy at present.

Yours Respectfully,

H. I. CORSON, Secretary.

In reporting the proceedings of the first meeting above referred to the Glencoe Register, says:

The first regular meeting of the McLeod county horticultural society was held at the court house hall last Saturday. The society organized by electing the following list of officers:

President—Milon Cutler, Sumter.

Vice President—Wm. Getchell, Glencoe.

Secretary—H. I. Corson, Glencoe.

Treasurer—J. Nobles, Glencoe.

Executive Committee—Carl Hagan, Sumter; Dr. Benjamin, Hutchinson, and Jacob Koons of Penn.

Mr. Pearce of Minneapolis, addressed the meeting upon the subject of the best varieties and the best methods of cultivating small fruits, such as strawberries, raspberries and blackberries, giving his own experience in handling the different varieties. There was but a small number of the farmers present, not over twenty, as it was a bad day, but all those who were present expressed themselves as having been richly paid for their time and trouble in getting there. We predict that the horticultural society will become a useful, as well as creditable institution. The president gave each of the members present a copy of the annual report of the State Horticultural Society. After adopting a constitution and by-laws for the government of the society, it adjourned to meet at Armory hall on the last Tuesday in March.

MINNESOTA VALLEY HORTICULTURAL SOCIETY.

GRANITE FALLS, MINN., March 1, 1886.

S. D. Hillman, Secretary, etc.

Books received all right, just in season for our meeting. Please accept the thanks of Minnesota Valley horticultural society, for the same.

Our adjourned meeting occurred to-day and was a grand success. We try to make the social element an enjoyable feature of our meetings. We had a basket dinner in the hall which was enjoyed by all.

The subjects discussed were as follows: Spring Care of Small Fruit Plants, Planting of Fruit Trees, Ornamentation of School Grounds, Streets and Highways, followed by a miscellaneous conference on general horticultural topics.

The discussions were lively and interesting. Following the discussion of Ornamentation a resolution was passed that each member

plant or cause to be planted one or more trees on the highway or some other public place, and report such action at the next meeting of the society. In addition to this action a committee was appointed in each town where we have a membership to bring this matter before the town meetings and thus secure united action of all citizens in the matter so far as possible.

We are to have a record of all trees planted this year by our members and this reported to the society at the next meeting—this to embrace fruit, forest and ornamental trees.

We are getting in good working order and are securing new members right along. We hope to be able to report some good work by this society at the next annual meeting of the State Society.

Yours truly,

O. E. SAUNDERS,
President.

CORRESPONDENCE.

KIEW, RUSSIA, Dec. 28, 1885.

S. D. Hillman, Secretary, etc.

Having read in the transactions of the American horticultural society that your Society has received several medals for grapes, at the New Orleans World's Exposition, and knowing Minnesota as a State with severe winters—like our Russian—I take the liberty to ask you to have the kindness to inform me of the manner of cultivating the grapes in Minnesota, and to name me papers containing information about this interesting subject.

Be so good as to name me also the apples, pears and other fruits of American extraction that grow in Minnesota, and which in your opinion would be worthy to be propagated in Russia.

If you want some information, or seeds, or plants from Russia, please to write me and I shall make my best endeavor to serve you.

Yours with great respect,

G. DOPPELMAIR.

On replying to the above the following was received:

ST. PETERSBURG, RUSSIA, Feb. 28, 1886.

S. D. Hillman, Secretary, etc.

Much obliged for your favor of the 14th of February, and the valuable information that you have had the kindness to give me about the growing of grapes in Minnesota, the growers of Russian apples, etc.

With Mr. Tuttle I am already in correspondence and Mr. Sias' name as a nurseryman is known to me from Mr. Gibb's work upon Russian apples, and the transactions of American horticultural convention that Mr. Rogers was so friendly to send me. I have read the program of your winter meeting and the papers to be read. Your transactions or reports must be very interesting and instructive and I will be very thankful to you if you will send me copies.

I have taken the liberty to mail you some seeds of cabbages, cucumbers, rutabagoes and onions that grow in open air in Petersburg 60° N. L., and some watermelon seed that must be sown under glass and transplanted with earth; they grow with us under 45-50° N. L., in the open air.

If you wish some other seeds please write and I will be happy to furnish you with them.

With great respect, yours,

G. DOPPELMAIR.

The seeds referred to were received by the Secretary March 30th and sent to Prof. Porter at the Experimental Farm, to be tested there.

Among the list of seeds are two varieties from the Crimea, one of Turkish origin and one from Astrekan.

Subsequently the following was received:

KIEW, RUSSIA, May 17, 1886.

S. D. Hillman, Secretary, etc.

Returned after an absence of some months to Kiew. I have found your highly esteemed letters and the copy of your annual report. For these favors, please receive my cordial thanks. I will send to Prof. Porter, cions of our apples, next fall, for your experimental farm.

Please give me some indications about your climate to be of assistance to me possibly in selecting cions, from varieties grown under similar conditions and regions of your own. If I am rightly informed you have cold winters and dry summers and with great changes of temperature in twenty-four hours. I think our country has somewhat similar conditions.

Would Prof. Porter be pleased to receive original seeds of *Pirus Malus bassota* or *P. M. frunifolio*? I can send him some.

With great respect, yours,

G. DOPPELMAIR.

FROM ESMOND, DAKOTA.

F. G. Dewey, of Esmond, in renewing his membership for 1886 writes:

Our section where we are located was only settled three years ago, although a few settlers were here north of us four years ago and it has been settled there five to seven years; therefore our knowledge of horticulture is limited, as we have been in the business only three years. Apple trees being very young here have produced hardly any fruit in this section. Crabs and the varieties known as "iron-clads" are doing fairly well. Plums and cherries are quite unknown. Gooseberries, currants and strawberries are doing splendidly here and will grow fair crops; also Turner raspberry and Gregg (where covered); grapes and Snyder blackberry has been nearly a failure here.

FROM BURLEIGH COUNTY, DAKOTA.

Emil J. Claussen of Bismarck, under date of May 29, 1886, writes:

The percentage of growing fruit trees is less each year, but I am not discouraged as yet. From all indications we need hardier roots to graft on than we have had so far, for this latitude and longitude. The extremes and peculiarities of this climate are beyond belief to one not a resident. I have a grafted Russian plum which has set a few plums this spring, no apple blossoms as yet; small fruit does well with proper care.

We clip the following from the *Minneapolis Weekly Tribune*, under date of Dec. 10, 1885, from the pen of Mr. Gideon of Excelsior:

FRUIT OUTLOOK FOR THE NORTHWEST.

By PETER M. GIDEON, Excelsior.

Perhaps a few items on the apple question would be of interest to some of your readers, seeing the extent of last winter's ruin is now fully developed.

In traveling through Wisconsin, Iowa and southern Minnesota, it was sickening to behold the ruin of orchards, and but few live trees that showed health. In all my journeying the best, and I might say the only good show of live trees, was at C. G. Patten's, Charles City, Iowa. With great care he has been growing new seedlings, and with grand success. Trees strong in growth and as perfect in health as if they had never seen a winter, and with death or dying of old ironclads

all around them. His grounds teem with Russians; only three or four varieties showed health, and not half so large of same age as the new seedlings, and but few samples of fruit on any of the Russians, whilst the seedlings bore so profusely that some of them had to be propped up. Central Iowa and the whole northwest owe him a debt of thanks and they should not be slow to bestow the adequate reward. Certainly he is worthy of patronage; he has a fine stock of trees, and is a fair and honorable dealer.

We, too, have a fine showing of new seedlings that went through the last winter, and gave a fair crop the fall just past. So fine that I was awarded a silver medal for my exhibition at the American Pomological meeting at Grand Rapids, Michigan, in September.

Surely the ruin is a damper on orchardists, but they should not have in mind that fact, that the old ironclads had to succumb. We have other new ones that withstood the wreck—the hardest winter ever known in America, and the like may not occur again in the next 100 years, if ever. And even an approach to the last winter is not likely to occur inside of ten or fourteen years, which gives the planter that sets immediately an almost certain assurance of a rich harvest of many years of fruit, whether he sets the old iron-clads (the Wealthy and Duchess) or the more hardy new ones. Any of which will give a larger profit per acre in ten years—count from day of planting—than any farm crop that can be grown.

It is folly for anyone to yield up such luxuries at one rebuff, the like of which never occurred before and not likely to again very soon. I consider the Wealthy and Duchess safe to plant and too good to cast aside, though we have others of equal worth and hardier of later origin.

And now that we have a good collection that withstood the last winter with but little damage, and in season from Aug. 1 till March, and that collection yearly growing larger, none need despair of the future apple crop in the northwest. The ruin of trees is not confined to the northwest alone, but in a wide belt and stretching southeast to Columbus, O., and how much further I am not informed. Yet no one in Ohio, Indiana or Illinois doubts his ability to grow fruit there, and will reset and grow with profit the same varieties that were just killed out, and with our more hardy varieties our chances are full better than theirs.

But some may query as to why the last winter was harder on trees than other winters of as great extremes of cold? Our theory is, that a

warm current of air came from the southwest late in the fall that started the sap so that trees in warm soils and situations were in bloom—ours were just opening their bloom buds when winter set in, consequently any tree that could not stand to be hard froze in full sap flow, had to die. On cold stiff clay soil trees suffered least. And in further proof of our theory of dead trees, is the fact that throughout Michigan and on northeast exposure trees came through all right, whilst the same varieties were killed in states further south, where the extreme of cold is not so great. Therefore, I say to one and all, take courage, reset and go ahead, the ordeal is past.

PRUNING OF THE GRAPE.

By JESSE B. ROGERS, Milburn, New Jersey.

The following extracts are from a lecture by Mr. Rogers, Milburn, N. J., given at the request of grape raisers and fruit growers in attendance upon the second annual fair of the Hennepin County Horticultural Society, at Market Hall, Minneapolis, on the evening of the 23rd of September, 1885, reported by the Secretary.

Brother Horticulturists of Minnesota:

When, on the 14th day of September, 1883, the committee on native fruits in awarding the Wilder silver medal, reported to the American Pomological Society, then in session in Philadelphia, in these words: "We award the Wilder silver medal to the Minnesota State Horticultural Society for an exhibition of apples and grapes," Minnesota took her place among the states of this Union as a recognized horticultural power. Many of the delegates of your sister states for the first time had their attention called to Minnesota as a horticultural state. I was among that number, and I resolved for one to visit the spot whereon those grapes were grown. That I have done, and I have seen the place which Minnesota should always hold sacred in her horticultural annals.

This evening I intended to say something concerning the pruning of the grape vine.

* * You take a pair of iron shears in your hand and go into your vineyard. Unless the mind and the eye control the muscles of your hand you might just as well send a steam engine or a mowing machine among your vines to perform your work. My first point will be that you must educate your mind. The first great requisite is to perform more than one half of your labor in pruning the grape at your desk

or table by informing yourselves concerning the scientific culture of the grape vine; when you do that, books become secondary, mind primary.

When at Minnetonka, the other day, the complaint was universal: "We can't get fruit eyes, especially in the Concords." You all know the small terminal bud which puts forth in spring; every eye or bud of the grape is of the nature of that terminal bud. The spaces between buds are called internodes; the spot where the bud appears is called a node. A small protuberance appears, with a sharp end; that, if you will watch it for awhile, will give you the form of the wood-bud of the grape. So long as a rapid growth continues, no formation takes place except that of the wood-bud. If a too long growth is permitted, so many buds form, that nature is unable to modify or change by storing up the nutriment in the plant, or in that bud, to make it a fruited bud; so that, upon young vines, growers do not see fruit eyes when they are six or seven feet above ground; and why? Because of the rapid growth.

Buds of the grape may be divided into three classes: the wood-bud, the forcing fruit-bud, and the fruit-bud proper. Once know the distinction between these, and the pruning of the grape becomes a matter merely of the counting of the fruit-buds which you wish to have remain upon the plant.

Now, how is this change effected in practical grape growing? A bud appears at the node; that bud pushes; another bud appears in the axle of the leaf. A slight protuberance forms there, a leaf follows, and a wood-bud forms right in its stalk at the axle of the cane; that is where the bud forms which is always a wood-bud. If you allow nature to assume its sway, thousands of buds will form in a year, and as nature only wishes to perpetuate its species, the fruit-bud will form at indefinite places, so that in pruning you have to follow nature. When your vine makes a sufficient growth, you can check it without forcing this bud which forms in the axle, simply forcing the bud into a lateral, and a bud forms underneath. If you pinch it too close this bud will again break, and then you have lost from a month to six weeks in the formation of your fruit-bud; continue that process the summer through, and you have no fruit-buds at all. If, however, you pinch the end and force a lateral, your bud remains. Now allow this lateral to grow and extend in length; pinch it there again, and a bud forms underneath each of these leaves, which in process of time changes by becoming larger at the base, more round and less pointed. After

awhile it forms what is known in grape culture as a forcing fruit-bud. A forcing fruit-bud is one which is unfolded by taking undue nourishment from the vine at the expense of its vitality. Protect the same bud longer, its sharp apex disappears and it becomes a full fruit-bud. Have you never noticed at the axle the large number of wood-buds lying in there? That is nothing more than nature storing up too much vitality; so that if you have too large a fruit-bud you are running to the same extreme as too small, by having in the summer, three, four, or five shoots pushing from the same bud.

It may be asked if in some cases a fruit-bud does not produce fruit? I answer, yes. There is also another bud which appears, called an "adventurous" bud, which will sometimes produce fruit, although the bud is imperceptible to the grower in the spring. An adventurous bud is one that appears in an unexpected place; for instance, on an old cane you will find a shoot pushing from a place where you do not see a bud; that is called an adventurous bud. It is produced by too severe pruning. A wood-bud may sometimes produce fruit, but it is done at too great an expense of the stored up vitality of the vine. Thus summer pruning in its first results is the control by man of the nature and place of the fruit-bud. When you once become acquainted with the form of these three buds, pruning becomes a matter under your own control. You must have an educated mind, a quick eye, and a hand that never acts unless you ask yourself, "Why do I do what I am doing?"

When you prune the first time, reduce your vine from two to three eyes. I recommend this that the root of the vine may never become your master, but that you may become its master; so it is necessary to prune from the very first. We start then, in the second season, with two or three eyes. It is better to allow the second season two canes to grow, so that if anything happens to the one you have the other to fall back upon. After careful pruning at the end of the season, the question comes, "What form am I going to allow my vine to grow in?" On that question depends all after culture. Probably for the first three or four years some difficulty may be found in the controlling of a fruit-eye. When you prune at the end of the second season, prune one cane, if you wish to and can get a fruit-eye within a reasonable distance; if it be a new variety, or if you are in haste to see what your soil will produce, you may allow two or three bunches of grapes to grow, remembering, however, that now comes the time in which you must bend all your energies to keep your fruit-eyes

where you want them. In pruning for a fruiting vine the best experience in the state of New Jersey has demonstrated that never more than twelve fruit-eyes should at any time be allowed to grow upon a fruiting vine, no matter what its age may be. You may say twelve fruiting vines is a small number; but the result of that number is an average bunch of grapes weighing three-quarters of a pound to the bunch. To-day the largest bunch of grapes which you had on exhibition weighed thirteen ounces and a half; that is nothing more than what a vine should produce with scientific culture on fully two-thirds of the bunches it produces. Last year many bunches of grapes were grown in New Jersey weighing one and three-quarter pounds. From the second year onward your maxim should be, produce the finest fruit possible and protect your fruit-eyes. That is the main-stay of the grape culturists.

The question will arise whether to fruit upon new wood or upon old canes pruned to the so-called spur system. This question is easily answered when you once understand the nature of your fruit eyes. There are three prevailing lengths of pruning. The first is represented by the Concord family. With the Concord family I think it unsafe to run an old cane to the spur system for a long period. If I were to assign a reason, it is that the old cane becomes so hard, and so fully matures its eyes as to cause nature to spend a great deal of force in the spring bursting its buds which should be used in the development of the shoot itself. It has been found, therefore, that it is best, on the Concord, to use longer spurs of new wood. So you have to leave many more eyes on your canes than you wish. It is found, as a rule, with the Delaware, that it is better on longer fruited canes, if you trim from an old cane, to leave at least six or eight eyes on every spur that you make, and then select the shoot at the proper times. There is another class of grapes, the Diana, and most of Rogers' hybrids, that do better on very long old arms. In a conversation I had with Charles Downing, he said that the best Diana he had ever seen was fruited on an old arm fifty feet long; and on the Hudson river where they raise many of the hybrids, they find that long arms always give them a larger bunch and a better grape.

We now come to summer pruning. The eye bursts, and as I have shown, it is a compound eye, a large eye and an eye by the side of it. If the primary eye bursts first, a cold spell would check the growth and the shoot by its side bursts, then comes the question of which shoot to save. As a rule, if the cold weather continues long, the bunch on the

first shoot becomes weakened and never produces as fine a bunch of grapes as the secondary eye; so that the careful cultivator waits until about the time the buds burst. A grape vine never bleeds after three leaves are formed; before that time if you break a cane it will bleed. You may ask how many leaves you shall have beyond the last bunch of grapes. My answer to that is, it is something like the formula to a patent manure—you must be your own judge; according to the vigor of your vine and the experience had with the variety you are growing. Your grapes run to compactness. This may be due to pruning too long in the summer, or by not enough organic manure in your soil to give vitality to the vine. If it is caused by the latter, the sooner the practice of dumping the manure of this city into the Mississippi river ceases, the sooner you will have finer clusters of grapes.

After you get to where you do not care to have a fruit-eye form you may remove the surplus growth there just as much as you please, because that part of the vine is nothing more than a weed to you, and you don't want to grow any more weeds than you can help.

Another important point in this country is that of earliness in the maturity of your fruit. Nature compels you to take the first requisites toward earliness, that is, pruning sooner after the fall of the leaf. The European authorities and experimental stations have proven without doubt, and it has been demonstrated also by the American grower, that the sooner you prune after the fall of the leaf the earlier your vine bursts in the spring. Hence, in a climate where you are compelled to prune early and cover your vines, if you are in a place where late frosts prevail, don't uncover your vines before you are compelled to in the spring. The nearer the surface of the ground you can put your fruit and avoid dirt, the quicker it will come to maturity in the fall.

Another thing which I see practiced here is, too late disturbance of the soil. We in Jersey find that even in our winters we cannot disturb our soil within six weeks before the ripening of the fruit, unless it is done at the expense of the fruit-bud the next winter; so that in all fruit culture it is a question when to stop cultivating. To be successful in raising the peach or grape, culture must stop sufficiently early to allow the bud to harden.

While on the experimental farm Prof. Porter called my attention to the fact that he had stopped cultivating except to just cut the weeds with a hoe around the Russian trees. I said to him, "I suppose you do that to ripen your wood?" He said, "Yes, sir, I do; and the question

we have got to solve is, how can we cultivate deeply and save our buds. I have almost arrived at the conclusion that when cultivation stops with the hoe, about the middle of June, to cultivate longer is dangerous to the bud the following winter, should we have a hard one.'"

You have foes to your grapes. The fact cannot be disguised that mildew and rot are among you. At least two species of rot and one of mildew I have seen. That is one of the penalties that every fruit grower has to contend with in the raising of fruit. It need not discourage you; many have contended with it before. I wish I was able to give a remedy for it; I am not. If you want to see it in its beauty and in its destructiveness, visit New Jersey.

You have a very encouraging prospect. Your prices are two to three times what ours are on the Concord, and nearly double on the Delaware. With this standing in view, let the mildew and rot deter no man from planting grape or any other fruit. Any man that is deterred from raising sufficient fruit for his own family because of the terrors he has to contend with, is a coward. The whole question of fruit culture resolves into that of the cultivator becoming complete master of his vine or tree. If you will take the poorer land and fertilize it as it is best, I think you will have the greatest success.

DISCUSSION.

Mr. Pearce inquired if he considered it best to allow fruit eyes to form on the latterals.

Mr. Rogers. Yes, and no; the whole secret is to get just as short a cane as you can, or just as long a cane with the eyes close together. If you allow ten or twelve fruit eyes to form on the latteral, you have many places to choose from; and if your cane gets very long, it is better to fruit on the latteral than on the cane.

Mr. N. H. Emmons. Allow me to inquire: Take new vines that have grown ten or twelve feet the first year, how far back would you cut them for the winter?

Mr. Rogers. Two or three eyes, sir.

Mr. Emmons. From the ground?

Mr. Rogers. From the ground. You have got to have good roots to maintain your vines. It is a mistaken idea to fruit a vine too much until it becomes established the second year; make two prunings of it; you will save time in the future if you do. I may say that in planting an extra one-year-old vine, it is as good if not better, than the two-

year-old vine from the cutting. It makes some eighteen inches of growth the first year, and as a general thing it will have better roots and in a better compass than a two-year-old.

Mr. Busse. I would like to ask: Is it best to leave one or two canes to the plant at the end of the second year? Which would produce the best and most fruit, to have one or two?

Mr. Rogers. I never allow a vine to fruit much the second year. It makes no difference provided you leave about an equality of eyes when fruiting on each cane. There may be some advantages in leaving only one cane in layering. Bear in mind never, on a bearing cane, leave surplus canes.

Mr. Emmons. How late do you recommend continuing your summer pruning in the season?

Mr. Rogers. That is a difficult question to answer. Mildew as a general thing, appears on the younger shoots; is more apt to attack them than the older shoots, and it is a question that only experience can demonstrate; no rule can be laid down. I should continue it until I was sure that I would save and form my fruit-eyes. And if I found that too much strength was going from the vine into the bunch, then it is a question whether it is not better to risk a little mildew. Experience must be the guide.

Mr. Pearce. In New Jersey do you grow from cuttings or layers? or, in other words, which is considered the best?

Mr. Rogers. We grow mostly from cuttings, unless it is some variety difficult to propagate from cuttings.

Mr. Pearce. Is there any marked difference between cuttings and those raised from a single eye in hot-houses?

Mr. Rogers. I don't think there is, provided the eye be mature and perfectly ripe; but in the new varieties grown from new wood there is a marked difference. If you have a cutting that has three or four eyes, cut off the roots below the lower eye and you have it. I am told that bone dust does you no good; but if I were going to grow grapes here, I should go into its use experimentally, and should use bones from which glue is made—from which all the ammonia has been removed and only phosphoric acid is present. As a general rule all bone dust that contains ammonia is detrimental to fruits. The nature of bone-dust is to ripen the wood early. If used in too large quantities it contracts the wood-cell so that the sap will not circulate, hastens early maturity, and the fruit will remain of a small size, mature early and drop off.

Mr. Grimes. What do you think of common wood ashes and lime as a fertilizer for grapes?

Mr. Rogers. I think you have lime enough in your soil here without anything added. Wood ashes, as a general thing, add vigor to the growth. If you want to experiment with them at all, do it very gradually and with very few, and do not use too many ashes. I once tried half a bushel to thirty vines, planted in a row, six feet apart. The peduncle became so weak it wouldn't support itself, and my grapes dropped from the vine. The vines made an extraordinary growth the first year, and the next I had a very fine crop of fruit. If you experiment with wood ashes, take a few vines and put on different quantities and notice results. If applied too heavily it will require a careful system of summer pruning, as it excites the growth too late. Its first effect is to make the crop earlier, although its latter effect is to show itself in early ripening about the second year.

Mr. Harris. You advise not to cover the vines until early winter sets in?

Mr. Rogers. That is the rule. If you cover the vine, never cover while there is any danger of the rotting of the bud by warm weather taking place, and don't let the cane become soaked with water. Never permit water to stand and ice to form around the collar of a plant, for it is almost sure to kill any vine or any fruit tree—it stops the circulation.

Mr. Roberts. Would it be advisable, in setting vines, to put bones and old leather under them, and would that be of any benefit?

Mr. Rogers. Do you mean in amateur culture or commercial?

Mr. Roberts. In either.

Mr. Rogers. In commercial practice it will be well to experiment, if it don't cost too much for labor. To make a trench, take large ones and pave the entire bottom, and on top of that put some bone-dust. That is done a great deal. One of the most successful amateurs I know of digs down two and a half feet deep, paves with bones, and on top of that puts about ten or fifteen pounds of bone-dust mixed with earth. He raises the finest grapes I know of, but the expense is too great in commercial culture.

Mr. Harris inquired if burning a vineyard would not destroy the insects, and if it would not be well to plant again at a distance of half a mile to avoid the mildew?

Mr. Rogers. I don't think a distance of half a mile would be sufficient, for experiments in New Jersey have shown that mildew will

travel half a mile; but I do not think you should grow a vine ten years, especially the Concords, for the older the vine the later the fruit matures. It will make a difference of about ten days.

Mr. Harris. Do you know of any remedy for the blue beetle or the curculio?

Mr. Rogers. At our agricultural society meeting, Prof. Riley was present, and the question came up of getting rid of the blue beetle that burrows into your bud in spring and eats it all out. He recommended, what I had found to be true, that a Clinton, which is about the earliest vine there, be planted; the insects would collect on the Clintons, and then poison could be applied and soon the vineyard would be very nearly rid of the pests.

AMERICAN POMOLOGICAL SOCIETY.

The twentieth session of the American Pomological Society was held in the city of Grand Rapids, Michigan, Sept. 9 to 11, 1885. An excellent and concisely arranged report of the proceedings appears in the transactions of the Indiana horticultural society, prepared by Prof. J. Troop, of Purdue University, which, for lack of space for a more extended notice, is inserted here:

At the opening session Secretary Beal announced that the President, Marshall P. Wilder, of Boston, could not be present for reasons expressed in the following note:

"Gentlemen of the American Pomological Society:

"I still live, and would most gladly be with you on this occasion, but as discretion is the better part of valor, I am compelled by the advice of friends of our cause not to take the risk of so long a journey, and the consequent fatigue of our session, but to reserve my health and strength in the hope that you will come to me at Boston, in 1887, when we may consult personally again on the great interests which our society has in charge."

It may be of interest to some to know that this veteran Pomologist is now over 87 years of age.

Patrick Barry, of Rochester, N. Y., was chosen President *pro tem*.

After a few well-chosen words of welcome from Mr. Lyon, president of the Michigan horticultural society, the chairman introduced Dr. J. B. Angell, of the Michigan University, who delivered a very interesting address, in which he cordially welcomed the society to the state. In the course of his remarks he said:

"The memory of most of us easily runs back to the time when few or no cultivated strawberries were to be found anywhere in the land, and now your reports easily enumerate, I suppose, 400 or 500 varieties. Substantially the same statement can be made concerning the grape. Similar if not equal progress has been made with other fruits. I suppose the value of the fruit crop of the United States in a good year must approach \$100,000,000. And the increase in the quantity has hardly been more remarkable than the improvement in quality."

After this address the committee on credentials reported the list of delegates present, the number being unusually large, including most of the leading pomologists of America.

Next came the usual discussion as to where the next meeting should be held. J. B. Moore, of Massachusetts, offered Boston, in behalf of the Massachusetts horticultural society. He urged that the place be accepted in order that; if his life be spared, the venerable president might be in attendance. It was so decided.

The following officers were then elected for the next two years: President, Marshall P. Wilder, of Boston; First Vice-President, Patrick Barry, of Rochester, N. Y.; Treasurer, Benjamin G. Smith, of Cambridge, Mass.; Secretary, Chas. W. Garfield, of Grand Rapids, Mich. At this point a telegram was ordered sent to President Wilder, notifying him of his re-election as President of the society, to which he replied as follows: "All right; go ahead. I accept the presidency. God bless the old Pomological."

The next business of importance was the reading of the address of President Wilder, by ex-Secretary Beal. In it he says: It is thirty-seven years since the society was organized. His resignations as President has always been declined, and a special officer having been selected in his place when absent, he regarded such action as a testimonial of regard for past deeds rather than for anything he could now do. He alludes at length, and very fittingly, to the society's mission, to what it set out to do, and what it has so well accomplished. He alludes tenderly and affectionately to the death of Charles Downing, according him a high place in history. In the list of the society's accomplishments, he enumerates a higher standard of excellence in judging, education of taste, discouraging cultivation of inferior sorts, more than 600 varieties having been discarded; a uniform system of rules for judging; reform in nomenclature and many other things. He again urges "a sytem of nomenclature pure and plain in its diction, pertinent and proper in its application," and asks the nurserymen to aid in this reform by revising their catalogues. Speaking of improvements by

cross-fertilization, he asks for a pear "with the richness of the Seckel, form and size of the Bosc, and vigor and productiveness of the Boussock." Again he urges the injunction "Plant the most mature and perfect seeds of the most hardy, vigorous and valuable varieties; as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence. Go on! Go on! while you live, and when we are gone, others will rise up to chant our old song:—

Plant the best seeds of all your best fruit,
Good fruits to raise that some lands may suit;
Fruits which shall live their blessings to ahead,
On millions of souls when you shall be dead.

Plant! plant your best seeds—no longer doubt
That beautiful fruits you may create;
Fruits which, perchance, your name may enshrine,
In emblems of life and beauty to shine."

In conclusion he adds: "Fruits are the overflow of nature's bounty, gems from the skies, which are dropped down to beautify the earth, charm the sight, gratify the taste, and minister to the enjoyment of life; and the more we realize this, the more shall we appreciate the Divine goodness to us, and the duty of providing them for others."

The subject of new fruits was then taken up, and apples being the first called, Mr. Green, of New York, asked about Yellow Transparent. Mr. P. M. Gideon, of Minnesota, said it was of Russian origin, and about as hardy as Oldenburg, although last winter proved too much for it. Several members spoke well of it as an early apple, which was two weeks earlier than the Red Astrachan. Mr. Chase wanted the Dickenson apple to go on the list starred for Pennsylvania. It was a seedling of the Yellow Bellflower, and similar to it in quality. The Shannon apple was thought by many to be especially adapted to the soil and climate of Arkansas. Mr. Lyon said it was of poor quality, but good to sell. The Cellena was said to be of Polish origin, and about as hardy as Fameuse. The Glast apple was considered by Mr. Auger, of Connecticut, as being delicious for baking and a fine fruit generally. Mr. Gibb said the Thaler was considered an early market fruit in Nova Scotia, ripening in July much like Yellow Transparent. Mr. Lyon asked about Wolf River, a seedling shown at New Orleans. Mr. Gideon said it proved tender in Minnesota. Prof. Budd thought it was 30 per cent. hardier than Fameuse. Mr. Gideon said the hardiest apples, before last winter, were the Oldenburg and Wealthy; but last winter killed these also. He said the more crab we can get into our seedlings the hardier they are. In response to an inquiry regard-

ing the Excelsior and Gideon crabs, he said that both varieties originated with him from seed of a small crab. From five hundred seedlings of Excelsior only twenty proved hardy. The Salome apple was well spoken of by several members. The Northwestern Greening was not hardy, otherwise a promising variety. Mr. Gipson, of Colorado, asked about Lon apple. Mr. Gideon, of Minnesota, replied that the Lon apple originated on his farm. It is very early and succeeds well in the south, as well as where he lives. It would drive any other apple out of the market; one of the hardiest trees and of excellent quality. The Missouri Geneting was well spoken of for the east. The Ohio Greening was said to do better in Michigan than the Rhode Island Greening. Commissioner Colman spoke of Wright's Genet, which he had been instrumental in bringing to notice. It resembles Rawle's Genet, but was a much larger tree. Prof. Budd spoke of one of the Russian apples which, he thought, should have more general notice. The name translated into English was Longfield. It was hardier than Fameuse, larger than the Jonathan, yellow, and about the size of the Missouri Geneting. Mr. Barry remarked that the Fameuse was good enough for anybody. He said: "Up in the Adirondack region they can grow nothing else. The trees are loaded." Mr. Gibb of Quebec, considered Whitney's No. 20 the best of the crab class. Mr. Gideon considered it several removes from the Siberian crab species. It had but very little crab blood in it. Early Strawberry was favorably mentioned. Mr. Woodward, of the Rural New Yorker, thought every family should have at least one tree of the genuine crab; there is nothing to compare with it in the apple line for making jellies. This closed the discussion on apples, and at the evening session the society listened to an illustrated lecture on "The Injurious Fungi in relation to the Diseases of Plants," by Prof. C. E. Bessey, of Nebraska. He stated that the only remedy for this fungus was the knife. The diseased portion must be cut off, whether it be a leaf, limb, tree, or whole orchard.

At the morning session of the second day Prof. J. C. Arthur of the New York Experiment Station read a paper on the same subject; he however confined his remarks more especially to pear blight. The paper was well received, but the audience was left in ignorance concerning the most important point, viz., a remedy for the disease. In speaking of protection from frost, Prof. Lazenby, of Ohio, said, that in his tests with mulched and bare ground, he had invariably found a difference of from 3 to 5 degrees in favor of the bare ground. The

mulch prevents the absorption of heat by day, and radiations by night. Mr. Morill, of Michigan, preferred to mulch nevertheless, because it paid in dollars and cents. Mr. L. B. Pierce, of Ohio, then read a paper on "How to conduct State and Local Horticultural Societies." The paper was so full of good sound suggestions that I may perhaps be pardoned for giving a few of them here. He said: "Exhibits of fruits, flowers and vegetables at each meeting should be encouraged, as they are valuable object lessons, fixing knowledge of varieties, and correcting erroneous ideas. State horticultural societies were representative bodies, and the social feature had to be abandoned to a great extent. In times past these organizations had devoted themselves largely to introducing and encouraging new fruits and to reports of the seasons, known as ad interim reports from officers. This work is not as necessary as formerly, owing to the large number of fruits now known and the disposition of originators to push them into notice. State societies should have the backing of the legislature with liberal appropriations and they should be aggressive in their work, pushing it by the personal work of the secretary, who should be paid sufficient salary to enable him to devote his whole time to the work. There were thousands who knew neither the delights of using or of growing the finest fruits and flowers, and these should be reached by the establishment of local societies. The work that a live state horticultural society with one or more efficient local societies in each county can do in the lines that I have briefly indicated is great, and sooner or later will have to be done." Mr. L. A. Goodman, of Missouri, gave some "Lessons from the World's Fair." Mr. Lyon, of Michigan, followed with a short paper on "Nomenclature of Fruits." The subject was ably handled and the paper full of good suggestions. Mr. Gibb, of Quebec, spoke on "Nomenclature of Russian Fruits," and said that in Minnesota the Lieby was coming into notice on account of its hardiness. A resolution was adopted to the effect that before these Russian apples are placed in the society's catalogue a committee should be appointed to revise the list and the names.

A lengthy discussion followed Prof. Lazenby's paper on the "Influence of pollen on the size, form, color and flavor of fruits." Mr. Fuller, of New Jersey, favored the theory, while Mr. Williams, of the same state, as strongly opposed it. Dr. Hexamer, of New York, said: "No matter what scientific men say about these things, that it can not be, because it is against all principles of science, I consider the theory highly probable, and I know that such influences do occur."

After Mr. C. A. Green, of New York, had read his paper on "The Hardiness of Plants," the discussion of strawberries was begun by Mr. Williams of New Jersey, and Parker Earle, of Illinois, was asked the name of the best strawberries grown by him. He said: "I consider the Crescent best of all. I fail with almost all other kinds." Commissioner Colman asked, "Why is Crescent better than the Wilson?" Mr. Earle replied, "That it was because he could grow it and so get it to put into market, which he could not do with the Wilson on account of the rust; this did not effect the Crescent, in the least. Then, again, the Tarnished Plant Bug prevented the successful culture of most other varieties." Mr. Morrill, of Michigan, said: "Down on the lake shore we use Crescent for early on light soil, and Sharpless for late on heavy soil." Dr. Hape, of Georgia, and Engle, of Pennsylvania, preferred the Sharpless. Blackberries came up next for discussion. Stone's Hardy was said to be hardier than the Snyder, but too small for market. Ancient Briton was very successful at Ripon, Wis. Mr. Johnston, of New York, said that as a rule the hardy blackberries are small. Mr. Green said the Evergreen blackberry was of no value. Several members reported the Early Harvest as winter-killing badly. Mr. Munson said it belonged strictly to the south, and, with Brunton as a companion, both succeeded well, producing from 5,000 to 6,000 quarts per acre. Mr. Campbell, of Ohio, said the Lucretia dewberry was as good as anything he had tasted in the way of a blackberry, but it must be entirely ripe. Mr. Scott thought that Taylor's Prolific was better in quality than the Snyder; but Mr. Lyon could see but very little difference between them. A valuable paper on blackberries by Mr. Cowing of Indiana, was read.

Raspberries came next and Caroline was asked about. Mr. Green and Mr. Rogers considered it an excellent berry but too soft for market. There was a great deal of discussion concerning the Shaffer. It was generally considered, however, to be an excellent berry for canning or cooking, but the color was against it. Mr. Morrill asked about the Nemaha. Mr. Green and Mr. Scott found it hardier and better than the Gregg. The Marlboro received much praise with regard to productiveness and earliness; the quality however, was only fair. Mr. Engle thought the Rancocas had come to stay. Dr. Hexamer said it ripened its entire crop in from eight to ten days. Mr. Hobbs said that Crimson Beauty was a strong grower, hardy, of beautiful color, better than Hansell or Marlboro, while Mr. Green never could get a perfect berry from it, after four years cultivation. At the

close of the afternoon session of the second day, Mr. Campbell, of Ohio, read a paper on "American Grapes Forty Years Ago." Said he, "Catawba, Isabelle and Clinton, were about the only varieties we had.

"Mr. Downing names only about one hundred and sixty varieties in his catalogue. In 1880 the Mississippi Valley society had two hundred and forty-nine distinct varieties on exhibition. Now, we probably have over three hundred in cultivation, and still they come. But improvement in character and quality has not kept pace with the increase in number of varieties. In quality very little advance has been made since the Delaware. We have mildew of foliage, rotting of fruit and tenderness of vine in winter. Perhaps these obstacles will be entirely overcome in the future. What is wanted is a vigorous vine that will resist attacks of mildew, endure a temperature of 40° below zero in winter, and 100° above in summer. Hardiness, healthy foliage, and good quality are now the desired points in grapes. There is a tendency to too many new varieties. Many are most unworthy, but advance has been made and still further improvements may be expected in the future."

The evening session was given up to an illustrated lecture on "Economic Entomology," by Prof. Cook, of Michigan. At the morning session of the last day, after the usual amount of routine business had been disposed of, Commissioner Colman, of Washington, addressed the society, after which came a paper on "American Grapes," by T. V. Munson, of Texas. This paper was among the ablest presented during the sessions. The subject was treated from a scientific standpoint, showing the characteristics and adaptabilities of the different species of grapes. A discussion of some of the newer grapes was then taken up. Mr. Rogers, of New Jersey, spoke of the Ironclad grape, and said that it was worthless; and Mr. Hubbard, of New York, said that it was a worthless wild fox grape, and good for nothing. Mr. Lyman, of Virginia, had grown the Wyoming red for years and pronounced it very good. Several other members spoke favorably of it. The Niagara was pronounced good, free from mildew and rot, and as hardy as the Concord.

Mr. Barry, of New York, thought the Empire State was a good variety. Mr. Campbell said it was fine flavored and remarkable for healthy foliage. Several members had grown the Ulster Prolific, and pronounced it one of the best.

Mr. Smith, of Massachusetts, spoke favorably of the Hayes, as did

Mr. Manning and Mr. Campbell. Mr. Hubbard, of New York, spoke of the Centennial as having a small berry, but large cluster and good quality. Mr. Campbell said it was not hardy. Amber Queen did well with Mr. Hubbard for awhile, but not so good now. Victoria was well spoken of for New York. The Triumph was said to be very promising in the south. Eldorado received no words of praise. "Not worthy of cultivation," was the general verdict. The Highland rots badly. Vergennes was said to be very promising; good reports concerning it were made from many states. Early Victor was praised by several members as being a strong, healthy grower, inclined to overbear; but Mr. Munson said it was not profitable in Texas on account of the rot. Jefferson was generally condemned as being too late. Mr. Woodward said: "We can get it ripe only about once in ten years." Moore's Early received only words of praise from every section of the country. Lady Washington was spoken very highly of for the south, but too late for New York. Prentiss was too tender and mildewed badly. Worden was spoken very highly of for both north and south. Prof. Budd thought it was the best black grape we have in the west. A. E. Wordon entered the room during the discussion and invited the pomologists to take a drive at 1 o'clock P. M. out to the Munson & Knapp fruit farms, located about two miles north of the city. Private citizens generously offered the use of their carriages for the purpose. A committee, composed of Mr. Munson, of Texas; Auger, of Connecticut, and Uber, of Virginia, was appointed to compare the Worden and Concord grapes for the purpose of determining which is best in regard to time of ripening, size, etc. Continuing the discussion, Mr. Green thought the Duchess was one of the finest grapes of recent introduction, to which several members replied, "Yes, when we can get it." The Pocklington was said to be a strong grower, but subject to rot. Woodruff Red was a good market grape, but quality rather poor. The Eaton grape was mentioned by Mr. Manning as having a large, showy bunch, and quality good.

At the last afternoon session papers were read as follows: W. I. Chamberlain of Ohio on "Needs and methods of gathering fruit statistics;" "Packing and Shipping," by Parker Earle, of Illinois; "Fruits of the Northwest," by Peter M. Gideon, of Minnesota; "Insects Injurious to Fruits, and Remedies," by Prof. Lazenby, of Ohio; "Hard Problems in Pomology," by Prof. Budd, of Iowa. Among other things he said, "I am in favor of establishing experiment stations in every state and in various parts of each state in which new

fruits shall be tested under the charge of the state societies." Mr. Auger heartily endorsed this plan, and offered a resolution to the effect that each state society or board of agriculture be urged to employ a certain number of experts to try all new fruits that shall be submitted to them for growth and test, whose duty it shall be to report the result in each case. The resolution was adopted. The last paper was by Mr. E. T. Field, of New Jersey, on "The Cocoanut, its uses, and how and where to grow it." The committee sent to the Munson & Knapp farm to compare the Worden and Concord grapes reported. The Worden was considered the better, taking all things into consideration. The collection of fruit was large and very fine. The committee reported nearly 2,200 plates on exhibition, of which Michigan furnished 1,000; Ohio 114; Missouri 211; Ellwanger & Barry, of Rochester, N. Y., 140; Benj. G. Smith, Cambridge, Mass. 61; Henry M. Engle & Son of Marietta, Pa. 61; and Prof. L. H. Bailey, jr., Lansing, Mich., 75, besides several other smaller lots. The committee awarded the Wilder gold medal to Marshall P. Wilder for his collection of 100 varieties of pears.

The last evening session consisted of short speeches from about twenty of the most prominent members, after which the society adjourned to meet in Boston in 1857.

HORTICULTURAL LEGISLATION.

Chas. W. Garfield, the efficient secretary of the Michigan state horticultural society for many years past, has compiled some interesting facts relative to the legislation of the different states and provinces, from which we take the following extracts. In his introductory he says:

"In performing the duties which have devolved upon me since my first election to the office of secretary of the Michigan horticultural society, and in shaping the policy of the society, I have often questioned what other societies have done under similar conditions. In seeking the information desired, I have always found the secretaries of sister societies ready to render any assistance in their power, and oftentimes at a personal sacrifice they have furnished the data sought. It occurred to me during the last year that inasmuch as the matter of securing special legislation in the interests of horticulture and forestry was occupying the attention of societies and individuals in various states about us to a considerable extent, it might be profitable to in-

quire just what attention had been given by the law-makers of the land to questions that effect these interests."

With regard to legislation in California the report shows that an act was passed in 1880, entitled "An act for the promotion of the viticultural industries of the state," in which the governor is authorized to appoint a board of nine commissioners, who are required "to meet semi-annually and to consult and to adopt such measures as may best promote the progress of the viticultural industries of the state." The sum of \$10,000 a year for ten years was placed at the disposal of the board, whose duty it is made to look after the grape interests of the state in the greatest detail; especially with regard to the matter of diseases and insect pests. The law gives them power under certain restrictions, to seize upon and destroy infected vines that might cause contagion, imposes fines for transporting diseased vines or fruit, etc. In 1883 a state board of horticulture was created, providing for an inspector of fruit pests, and the sum of \$5,000 per year was provided to carry out the provisions of the act.

In 1885 the legislature of California passed an act in the interests of horticulture which provides, among other things, that:

"It shall be the duty of every owner, possessor or occupier of an orchard, nursery or land where fruit trees are grown within this state, to disinfect all fruit trees grown on such land infested with any insect or insects, or the germs thereof, or infested by any contagious disease known to be injurious to fruit or fruit trees, before the removal of the same from such premises for sale, gift, distribution or transportation. It shall be the duty of the owner, lessee or occupier of any orchard within the State, to gather all fruit infested by the insects known as the codling moth, peach moth, red spider, plum weevil, and kindred noxious insects, their larvæ or pupæ, which has fallen from the tree or trees, as often as once a week and dispose of or destroy the same in such a manner as to effectually destroy all such insects, their larvæ or pupæ."

It is further provided that:

"All fruit trees infested by any insect or insects their germs, larvæ or pupæ, or infected by disease known to be injurious to fruit or fruit trees, and liable to spread contagion, must be cleaned or disinfected before the first day of April, 1885, and on or before the the first day of April of every succeeding year thereafter."

Secretary Webb, in commenting upon the legislation referred to, says:

"My opinion is that all laws for the protection of the orchardist against the ravages of insects should be plain and simple in construction, and reasonable and not unnecessarily harsh in their application. The first and indispensable consideration, is a liberal appropriation of money by the state, and the creating of a board of commissioners—their actual traveling and incidental expenses to be borne by the state. This board shall be selected on account of their superior knowledge and experience in horticulture, and the appointing power in the selection of its members should by all means ignore party politics. The duties of the secretary of a useful and efficient board of horticulture such as every fruit growing state should have, will be so large and extensive as to require not a mere clerk but a first class man, and his compensation should be sufficient to pay him well for his time. The same as regards the office of the chief horticultural officer, who should devote his entire time and attention to the duties of his office, chiefly in the fields, giving instruction in the mode and manner of planting, pruning, cultivation, etc. In our state the secretary receives \$150.00 per month and the latter officer \$200.00 and all his traveling expenses are paid by the state. The last appropriation by our legislature was ten thousand dollars per year for the state board of horticulture; fifteen thousand dollars per year for the state board of viticulture; also viticultural, experimental, scientific and analytical work, including apparatus and suitable accommodations for the same, under joint control of the board of regents and the state university and the board of state viticultural commissioners, five thousand dollars per year. I have not a doubt but for every dollar our state has expended in aid of these interests there has been returned in an increase of taxable property, more than it would have been without such appropriations, more than twenty dollars for every one expended by the state.

Secretary Clark of the Colorado state horticultural society, after referring briefly to legislation in that state, says:

In my opinion the subject of fruit culture and tree culture should receive from our legislature special attention. Our supply of natural timber, never very large and limited in variety, will soon be exhausted and unless replaced by artificial growth, a heavy drain will eventually be made on the finances of the people to supply timber for mechanical uses. The question of the influence of forest trees on the water supply for irrigation comes in here, and is one of vast importance. The influence of forests on the evaporation and precipitation of moisture is not as generally understood as it should be, and facts bearing on this whole

subject should be brought before our law makers. Fruit culture calls for a more intelligent recognition by our legislatures. A liberal policy in this direction would hasten, by many years, the development of the fruit-growing interest, and save to the people of the state millions of dollars which will be sent abroad for fruits which can be raised here. Colorado possesses a greater variety of soil and climate than any other state in the union, and her possibilities are not yet understood even by our most intelligent people. Hence more light is what we need to show our law makers the direction in which they can best promote the interests of the people.

In Georgia a state horticultural society was organized as early as 1858, which is still in existence with a large membership and governed by a code of rules which have resulted in giving the greatest impetus to fruit culture. It is stated that "Its annual sessions and exhibitions are increasing in usefulness, and it is conceded that in no state has such a variety of pomological products ever been brought together."

In Illinois the state horticultural society was incorporated in 1857, and reorganized by an enactment in 1874.

It was largely through the influence of the leading spirits in this society that the state provided for a state entomologist, and by liberal appropriations secured the services of Walsh, LeBaron, Thomas, and Forbes, specialists, who have added so largely to the general information concerning the habits of injurious insects and means for their destruction. No state has done more efficient work for horticulture than Illinois in supporting the work in this field. The society took the initiative step which finally resulted in the establishment by the state of the industrial university, from which institution the horticulture of Illinois has received efficient aid.

The society in that state has a regular apportionment of \$2,000 per annum. The horticulturists of the state are awake to their interests and are moving for a fully equipped and carefully managed experimental station.

In Indiana a state society was incorporated under a general act of the assembly in 1875 and a place provided at the capitol for a museum and library. The annual appropriation is about \$400.

The Iowa legislature in 1872 passed a law with reference to the work of the state horticultural society, making it the duty of the society to encourage the formation of local societies in the interests of fruit-growing and tree planting; providing for an annual report of the secretary to be made to the governor; arranging for the publication

of the transactions of the society by the state; and their distribution by the state and the society, and providing an annual appropriation of \$1,000. Previous to 1879 there were printed 3,000 of the reports of the state horticultural society. Since that date an additional two thousand has been authorized. Later on, there is an enactment which compels school districts to set out and protect not less than twelve trees on the grounds about the school building, and directs the county superintendent of schools to see that the law is enforced. The legislature with perfect unanimity, gave the society a museum and an office large and convenient apartments on the main floor of the building, with a store room directly beneath in the basement, of sufficient size to accommodate quite large meetings of the society.

In Kansas a state horticultural society was organized in 1867 with twenty-five members, which has steadily increased in members and influence until the present time, when it has about 175 annual members.

Secretary Brackett writes:

"The law passed at the session of the last legislature was quite liberal as it appropriated a sufficient sum of money to cover the expenses of publishing an edition of eight thousand copies of our annual report, and six thousand copies of a forestry manual for each of the next two years. The policy of our state legislatures since 1873 has been to encourage a rapid and extensive development of the horticultural resources of the State by disseminating among the people a most thoroughly practical knowledge of successful methods of culture and of varieties of fruit adapted to our climate and soil, as a heavy immigration has been attracted to and induced to settle by the displays of products in eastern states—a class of lovers of fine fruit, but which was ignorant of the peculiarities existing in this state. The results have been gratifying. We have at this date over 20,000,000 forest trees, under successful culture, and about 150,000 acres of artificially planted forest trees, and the work of extension is heavier than at any previous date. This can be truthfully said to be the fruit of wise and intelligent legislation."

Secretary Boardman of the Maine state pomological society reports that "the \$500 appropriated annually is spent to the best advantage in encouraging pomology and horticulture. Our state assumes the expense of publishing our reports, which in some past years have contained matter of great value to our orchardists."

The Massachusetts horticultural society, organized in 1829, the

wealthiest organization of the kind in the world, has never received any aid through state legislation. Its annual gratuities in the way of premiums have been large, and its influence upon the progress of horticulture in this country has been greater than that of any other society. The Massachusetts board of agriculture, organized under state law and well supported by annual appropriations, has given horticultural matters their full share of attention. The state gives a bounty not to exceed \$600 per annum, to societies in the interests of agriculture. The following enactment exempting property of societies organized in the interests of horticulture from taxation, was passed in 1884: Such portions of real estate and public buildings belonging to incorporated horticultural societies as are used for their offices, libraries and exhibitions, shall be exempt from taxation.

In Michigan a liberal provision is made for the printing and distribution of the annual reports of the state horticultural society. The following is the text of the section under which the reports are printed and distributed: The secretary of the state horticultural society shall make a report annually, similar in character to that of the secretary of the state board of agriculture, but covering the subject of horticulture; eight thousand four hundred copies of said report to be printed and bound in like manner as the report of the secretary of the state board of agriculture. Six thousand copies shall be placed at the disposal of the state horticultural society, which shall be distributed in like manner as the report of the secretary of the state board of agriculture, giving preference to horticultural and pomological societies and fruit growers, wherever such may exist within the state, and the remaining copies shall be disposed of in the same manner as the joint documents.

MINNESOTA.

In 1877 the legislature provided a penalty for trespassing by hunters with dogs. There was also a law enacted for punishing those who willfully entered upon premises and injured trees or growing crops.

In 1873 the legislature provided for the printing of a limited number of the transactions of the state horticultural society annually and in 1881 the law was amended so as to appropriate a sum not exceeding \$750 annually for the publication of the state horticultural report, and \$1,000 for incidental expenses of the state horticultural society. Under the provisions of this act 5,000 copies of the report of the society were authorized, 1,000 of which number were to be

bound in cloth to be used in making the customary exchanges, supplying one copy to every library and scientific institution, and the balance to the society. In 1883 the law was so amended as to provide for the publication of 3,500 copies of transactions, limiting the size to 500 pages. In 1878 the legislature made an appropriation of \$2,000 for the purchase of an experimental fruit farm, also provided \$1,000 for Mr. Peter M. Gideon to use in developing and managing it. This appropriation is still continued. In 1881 the timber act was passed, which gave a bounty of three dollars per acre for six years to persons who would plant and maintain in thrifty condition 2,700 trees per acre, of any timber variety except black locust. The enactment also provides for a bounty of two dollars per year for each half mile of highway trees planted and maintained in thrifty condition for six years, the trees to be eight feet apart; cuttings and seed planting allowed under the act, but in such cases the first year is not counted. In 1883 there was an appropriation of \$5,000 to be employed in forest planting, editing and distributing literature in the interests of forestry, protection of forests, etc.

In Missouri the reports of the state horticultural society (organized in 1859) were printed by the state after 1863. The report, until recently, was issued as a part of the report of the state board of agriculture. Since 1879 the horticultural report has been issued as a separate document. For some years the state horticultural society has received an annual appropriation of \$1,250.

In Nebraska in 1873 the legislature voted an annual appropriation of \$1,000 in aid of the work of the state horticultural society, and its reports have been published at the expense of the state. For the year previous, the appropriation was \$2,000.

In New York liberal appropriations have been made from time to time in the interest of horticulture. The organization of an agricultural experiment station and the annual outlay of \$20,000 is largely in the interests of horticulture. The experiments heretofore conducted have already proven of great value.

The Ohio state pomological society, organized in 1847, was reorganized as the state horticultural in 1867, and by legislative enactment the proceedings were published by the state in the volume issued by the board of agriculture. An appropriation of \$300 per year was made by the same legislature for the use of the society in the prosecution of its work; and two years thereafter it was raised to \$500 per annum, and again in 1883 raised to \$1,000. The publication of the state horticultural reports with the volume of the board of agriculture

gives a wide distribution to the transactions of the horticultural society at no expense to that organization.

The transactions of the Pennsylvania fruit growers' association are published by the state in its volumes of agriculture.

In Vermont a state board of agriculture was established in 1871 with an annual appropriation of \$3,500. Among the duties prescribed in the act of establishment, is that the board shall investigate horticultural matters and make recommendations concerning the art.

In Wisconsin a law was enacted for the encouragement of the planting of timber belts, providing for a bounty of two dollars per acre, upon the certificate of the assessor. Also an act for the regulation of the sale of cranberries.

The state horticultural society was incorporated in 1871. The following year 2,000 copies of its reports were printed, \$150 being allowed for illustrations. In 1878 the number of volumes was increased to 3,000, with an appropriation of \$500 for the general purposes of the society.

In 1879 the society was reorganized, made a state institution and the secretary required to report to the governor. The reports were limited to 350 pages and to 3,500 copies. In 1883 the number of volumes in separate binding was limited to 500, while 11,500 were bound with other state reports to be distributed by the agricultural society. In 1885 a volume of 500 pages was authorized with an appropriation to the society of \$1,000 per annum for two years.

Mr. Plumb, of Milton, Wisconsin, writes:

The legislation in the interests of horticulture most needed in our state is a law establishing experimental stations; and for horticulture more than any other industry we have. Not one alone, but several located in the five or more climatical and geological districts of our state; these to be under the superintendence of the central station, but in the care of good, thorough, intelligent men or women, and all managed on a uniform plan. The advantage of such a system would be, 1st, to settle many now unsettled problems in tree and fruit growing for the state at large and for each division of the state, and much more satisfactorily than private enterprise can do it. 2nd, it would not only give direction to private enterprise but would give assurance and safety in it. No other state in the union has a greater variety of natural conditions, and therefore none so needy in this direction. Experimental stations should be in our state, adjuncts to an agricultural college,—which in time our state will have, when our farmers are educated up to their real needs in this line.

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